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Notes on the Coccidae of the Eastern
Desert of Egypt.

by W. J. HALL, A.R.C.Sc., F.E.S.,
Senior Entomologist, Ministry of Agriculture.



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IMPRIMERIE PAUL BARBEY

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INTRODUCTION.

The desert is a familiar sight to all who have ever lived in or visited Egypt but few can claim to have done more than look at it from a distance. A few preliminary general remarks on the desert may, therefore, not be out of place.

Approximately 94 % of the country of Egypt is desert land. This is divided into two by the long, and south of Cairo, extremely narrow strip of cultivated land running north and south that comprises the Nile Valley.

The popular conception of a desert is not infrequently one of vast regions of soft sand. It is true that tracts of such soft sand do exist, more particularly in the Western Desert, but they represent a very small percentage of the whole.

The Oases are confined to the Western Desert and lie in depressions of varying sizes in the plateau of the Libyan Desert. Most of the Oases are not easily accessible and a few are extremely inaccessible and

consequently their fauna is, at present, imperfectly known. It is not proposed to deal here, except in isolated cases, with either the oases or the Western Desert.

The Eastern Desert between the Nile and the Gulf of Suez or the Red Sea is mainly composed of rugged and bare limestone hills attaining a height in some places of over 6000 ft. above sea level. These hills and plateaus are intersected everywhere by wadis or dry river beds which have been carved out by the torrents that rush down on the rare occasions when there is a storm. The wadis are rarely in spate for more than a few hours in any one year.

As the rock is weathered down the salty constituent rises to the surface and forms a crisp hard crust. The nature of this crust may best be illustrated by the fact that a car can travel quite well over it but the moment it stops it tends to sink through into the softer sand beneath. When, therefore, heavy rains do occur the water pours off the hills and the plateaus into the wadis and it is for this reason that a storm is followed by a torrential flow in the wadis for a few hours only.

It seems hard to believe that these wadis can be swirling rivers and the infrequency with which it occurs is apt to make one a little sceptical. Those who are acquainted with the Suez Road will remember that it was not at all uncommon for the road to be washed away in two or three places. Indeed so frequent were these washouts that when the road was repaired recently culverts were constructed at all the vulnerable points to preserve the road for the future.

About the middle of March this year (1926) there were very heavy storms over the desert and I was told by an observer that in Wadi Sennur about 20 miles east of Beni Suef that the water was 2 ft. deep and had been very much deeper but was at the time of observation rapidly subsiding. The wadi at the spot in question is known to me to be about 200 yards wide.

About 10 days later I was in Wadi Ourag about 10 miles east of Saff and whilst the water was, then, only present in a few pot holes the force with which it must have come down the wadi could be seen from the fact that all but the well established shrubs had been torn up and had disappeared; those plants and shrubs remaining had been bent right over and in some cases partially torn out of the ground. At one point in the wadi where there was a small cliff some 20 ft. high the water swirling round the base had brought down literally tons of rock. No doubt the rock was cracked and weathered but the fact that one storm could cause the fall of so much rock leads one to believe that the weathering of this type of rock is not such a very slow process.

It is interesting to note in connection with the downpour referred to above that a portion of the British Army undergoing manœuvres in the neighbourhood of Saff were completely cut off by the water coming down to the Nile from the wadis and provisions for a few hours had to be supplied by aeroplane.

Such downpours, however, are local and there may not be such another storm in that area for years;

there may be, of course, light rains but not such as to cause a flow in the wadis. There is no doubt that many desert plants are specially adapted to utilize the dew which at times is very heavy. On one occasion when I was sleeping out in the desert in May my covering blankets were soaked through.

The extremely uncertain rainfall combined with the very high temperature registered during the summer months is such that only a very specialized flora can exist. Indeed so specialized is it that comparatively few forms are found which are common to both the desert and the Nile Valley. Some of those found in the cultivated area can adapt themselves to desert conditions and have spread into the desert. In the neighbourhood of wells and permanent or semi-permanent water the conditions are hardly true desert conditions and more cultivated forms are found. The reverse is also true; in the outliers of desert found in the Delta well known desert forms occur.

As if desert plants had not enough to cope with in the matter of climatic conditions, camels and goats are continually eating them down.

Another popular misconception is that the desert is devoid of life and the idea of a desert flora on the face of it sounds paradoxical. The vegetation is almost entirely confined to the wadis. The crisp salty crust of the hill and plateau, in fact of all but the wadi, has already been referred to. In the wadis the torrential flows of water at irregular intervals have washed all the salt out of the soil. This explains, in part at least, why the vegetation is confined to the wadis. The seeds undoubtedly exist outside the wadis and after rains

young seedlings may be observed, these do not survive long owing partly to their exposed position and partly to the fact that they are probably poisoned off by the salt content of the soil. The roots doubtless do not penetrate to the sandy subsoil and in any case the water content of this is very low because although the same volume of water may fall on plateau and wadi alike in the former case the hard crust causes it to pour off the surface rather than to percolate. Another possible explanation is that wind blown seeds find very little soft sand or soil to arrest them and consequently for the most part find their way into the wadis or if they start in the wadis remain in the same locality.

It is not an exaggeration to say that from six weeks to two months after heavy rains the desert may be quite green. It depends, of course, largely when the rains occur. If they are late and followed by a hot spell the young seedlings are killed off before they have time to establish themselves. Normally the vegetation of the desert is of the perennial type with a greater or lesser sprinkling of annuals according to the time of year and nature of rains.

The difficulty of carrying out anything like an extensive study of the desert fauna is primarily its inaccessibility. Camel transport is expensive and the organization of a caravan for those who are not used to it is not easy. It may be considered presumptuous on the part of the author to attempt to write a paper on his limited experience but it is thought that sufficient material and data of interest have been amassed to warrant a short preliminary contribution on the subject.

It is comparatively easy to arrange a day's excursion by car but it is not, of course, possible to penetrate more than a few miles in such a short time. The choice of route has to be made with care or progress is very soon held up by soft sand or boulders. A number of such trips have been undertaken in the neighbourhood of Cairo.

The only really easy way of getting right into the desert is by car along the Suez Road. This road runs from Heliopolis just north of Cairo to Suez right through the desert and as it has recently been repaired it makes it quite easy to get a day's collecting well out in the desert. Apart from various excursions along the Suez Road two big trips into the desert have been undertaken.

1. A fortnight early in May 1925 to the northern face of the North Galala Mountains about 60 miles from Helwan (by camel and foot).
2. A fortnight at the end of February and beginning of March 1926 to Wadi Araba, between the North and South Galala Plateaus, to a point about 85 miles east of Beni Suef — nearly to the Gulf of Suez (by camel and foot).

During these two trips very many wadis were passed and a great quantity of material collected.

Practically the whole of the material dealt with in the present paper has been collected in that part of the Eastern Desert bounded by the Suez Road to the North and a line running due east from Biba to the South.

I am indebted to many gentlemen for bringing

me in material and I have acknowledged this in every case by including the collector's name in brackets immediately after the record of the material collected.

It has already been pointed out that the flora is of a highly specialized type and that few plants are common to both the desert and the Nile Valley. The same also applies to the fauna. The habits of the COCCIDAE are such that perennials receive more attention than annuals and this is more marked than ever in the Coccid desert fauna where the life of annuals is so very precarious.

Of the 38 species recorded 22 are, so far as is known, indigenous to the desert; the remaining 16 are for the most part not of desert origin but have encroached where the host plant or other plant of the same genus is found or finding suitable host plants have been able to adapt themselves to desert conditions. Some of the species have been found to be widely distributed in the Egyptian desert and it is likely that they extend across the Sinai peninsula farther east and up into the Palestine desert. Certain Egyptian species have already been collected in Palestine by Dr. Bodenheimer. How far they extend to the west is entirely unknown. One species, at least, is common to Algeria and Egypt and as many of our common Egyptian desert plants occur in Algeria it is quite possible that a study of the Algerian desert Coccid fauna may reveal the presence of some of our Egyptian species.

The present paper contains very little that is new but it is thought that bringing together all the in-

formation on the desert species will be of value as a starting point for any student who may subsequently take up the study of the desert fauna of Egypt or neighbouring countries.

Part I.

Apparently true desert species.

There are 18 species which, so far as is at present known, are confined to the desert. For the most part it will be noticed that these attack plants which are confined to the desert. In each case the reference is given to the original description of the species and to Egyptian references. A general description is given of the appearance of the living insect to enable identification in the field. Where the species is referred to as "widely distributed" it means widely distributed in that part of the Eastern Desert under special consideration i.e. that bounded by the Suez Road to the north and by a line running due east of Biba to the south.

1. *MONOPHLEBUS GYMNOCARPI* HALL.

BIBLIOGRAPHY :

Hall, Min. of Agric. Bull. No. 72 p. 1 (1926).

HOST PLANTS.

Caryophyllaceæ	<i>Gymnocarpus decander.</i>
Chenopodiaceæ	<i>Haloxylon schweinfurthii.</i>
Zygophyllaceæ	<i>Nitraria retusa.</i>

PART OF PLANT ATTACKED.

Aerial, usually the smaller branches.

DISTRIBUTION.

Widely distributed, but not yet found on the Suez Road.

DESCRIPTION.

Adult females taken on *Haloxylon schweinfurthii*.

Broadly oval in shape narrowed in front with a flattened frons; broadly rounded behind with a flattened posterior extremity; highly convex above and flat below. Colour orange some specimens being yellower and others redder. Antennæ and limbs black. Segmentation distinct owing to thin black intersegmental markings which broaden into a conspicuous dark spot midway between the median line and the margin afterwards becoming thin again and finally ending near the margin in a dark spot with two or three others scattered in the vicinity. The general impression is of a longitudinal line of dark spots midway between the median line and the margin, and another line submarginally on either side.

Just behind the frons is a well marked V shaped dark marking resting on a short transverse dark band. The abdominal markings whilst being carried through into the thorax are not quite so regularly arranged in that region.

Length 7 mm., Breadth 4 mm.

Adult females taken on *Gymnocarpus decander*.

Smaller, of a brick red general colouration with a wide longitudinal submarginal dark stripe. In this

case the insect did not show a flattened frons or posterior extremity. The difference in colour and the absence of dark spots give a different appearance from the specimens taken on the *Haloxylon schweinfurthii*.

Length 4.5 mm. Breadth 3 mm.

The single example collected on *Nitraria retusa* resembled those from *Haloxylon* but was of rather a reddish hue.

Adult male salmon pink to brick red in colour. Antennæ and limbs shiny black. Caudal appendages well developed, concolourous with the abdomen. Wings at rest held horizontally over the body. Costal nervure salmon pink. Colour of wings greyish or very pale dull brown, rugose. Body salmon pink with a little white secretory matter. Mesonotal plates black with a dark red central area. Head and thorax red. Eyes black.

Length 3.5 mm. Wing expanse 7 mm.

REMARKS.

Collected originally on *Gymnocarpus decander* in Wadis Gerrawi and Ibtadi on the 4th and 6th May 1925. This host plant is a low growing shrub of a stiff and impenetrable nature — an unpleasant plant to examine. The specimens, also, are extremely difficult to detect owing to their colour being the same as the old leaves and sepals of the flowers. The presence of a white cast skin I found to be a good indication that an individual was somewhere in the vicinity.

The first specimen was a male taken whilst

sweeping one of these shrubs (Alfieri) and although many were examined after this no further success was obtained until two days later a female was taken by sweeping (Efflatoun). This was in a *cul de sac* off Wadi Ibtadi containing about 30 of these shrubs. A careful and prolonged examination of these plants resulted in the capture of about a dozen females and one male. The larval stage and 1st. stage nymph were not taken.

No further specimens were captured until the end of February and beginning of March 1926. A single specimen was taken (Debski) on *Haloxylon schweinfurthii* near the top end of Wadi Suarka on 24.2.26 and later on 4.3.26 it was found to be relatively common on the same host plant in Wadi Araba (55 miles east of Beni Suef). No males were found. No specimens were found on *Gymnocarpus decander* during this trip but this may have been due to the fact that it was so early in the year that this shrub was only just beginning to show signs of life.

On the 2nd April 1926 I was fortunate enough to find a female in copulation on *Nitraria retusa* in Wadi Ourag (East of Saff). There were two males in attendance on the female and another on a twig close by. A careful examination of this and other NITRARIA bushes in the vicinity failed to reveal the presence of any further specimens either female or male. The fertilized female commenced egg laying on May 10th and completed laying a mass of eggs in a very loose tissue of white filaments about the 25th May. The eggs are reddish brown of the usual shape and half milli-

metre in length. Up to the time of going to press no larvæ have hatched out. (*)

2. **ANTONINA INDICA** VAR. **PANICA** HALL.

BIBLIOGRAPHY :

Hall, Min. of Agric. Bull. No. 64, p. 6, (1925).

Hall, Min. of Agric. Bull. No. 72, p. 33, (1926).

HOST PLANT.

Gramineæ

Panicum turgidum.

PART OF PLANT ATTACKED.

Either aerial or subterranean. In the former case it is usually found either very low down on the grass or at the nodes sheltered by the leaf sheath. A feature of this grass is the proliferation that often occurs at the nodes and within this proliferous growth the insect can usually be found.

DISTRIBUTION.

Widely distributed.

DESCRIPTION.

Female enclosed in a white felted sac which fits closely round the body of the insect. This sac has an opening to allow for the passage of the proboscis and another aperture at the posterior extremity through which a long white tubular filament projects.

Adult female denuded of sac ovoid, usually narrowed somewhat anteriorly dark brown in colour with a smooth surface. Microscopic preparations show that in old specimens the abdomen is densely

(*) The larvae began to hatch out on June 1st and are being described elsewhere.

chitinized this chitinous development shading off in the thoracic region. The posterior abdominal segments are always heavily chitinized in the adult female.

Length of adult female 2.75-3.25 mm. Breadth 2.25 mm.

REMARKS.

A very common species on *Panicum turgidum* in the Eastern Desert. It was originally collected on the Suez Road 1.11.23 (Kirkpatrick) and at Hamet el Abeed 16.11.23 (Kirkpatrick). Later Dr. Debski sent me some material he had collected in a wadi between the 5th and 6th Towers Suez Road on 13.8.22.

It was found to be very common in a small wadi off Wadi Nouega (near the north face of the north Galala Mountains) on 2.5.25. It is interesting to note that the *PANICUM* in this wadi showed the heaviest proliferation I have ever seen. In the main wadi the proliferation was very slight and the insect was also rare. Whilst proliferation is a feature of this plant it seems possible that it may be accentuated by the presence of this particular species. On the other hand it may be that the increased proliferation provides additional shelter and allows the insect to feed and multiply unmolested.

Collected at Geneife 15.6.25 (Housni), 6th Tower Suez Road 31.10.25 (Williams), Abu Sueir 4.11.25 (Housni) Between the 4th and 5th, and 5th and 6th Towers Suez Road 8.12.25, Wadi Araba 3.3.26, Wadi Nashash 5.3.26, Wadi Ghorab 7.3.26, 5th Tower Suez Road 24.3.26, Almaza near Heliopolis 25.5.26 (Taha).

3. PHENACOCOCCUS INERMIS HALL.

BIBLIOGRAPHY :

Hall, Min. of Agric. Bull. No. 64, p. 7, (1925).

Hall, Min. of Agric. Bull. No. 72, p. 33, (1926).

HOST PLANTS.

Capparidaceæ

Cleome arabica, *C. trinervia*.

Convolvulaceæ

Cressa cretica.

Frankeniaceæ

Frankenia pulverulenta.

Leguminosæ

Alhagi maurorum.

Zygophyllaceæ

Fagonia arabica, *F. mollis*,
Zygophyllum spp.

PART OF PLANT ATTACKED.

The roots.

DISTRIBUTION.

Widely distributed.

DESCRIPTION.

Adult female ovate to broadly ovate, Naples yellow in colour, covered somewhat sparsely but uniformly with white pulverulent secretionary matter. Marginal filaments wanting. Skin delicate.

At the period of gestation the adult female is enclosed in a shell composed of matted fibres, at the posterior extremity of this shell a mass of eggs is laid in a loose tissue of fibres. The size of the shell is very little larger than the fully developed adult female, the insect decreasing in size as the eggs are laid.

Eggs yellowish.

Length of adult female 2.5 mm. Breadth 2 mm.

REMARKS.

This species is relatively common but it is not

easy to find in any numbers because the individuals are so easily knocked off when the plant is pulled up by the roots and frequently the only indications of its presence are little white patches where the insects had rested.

The original material of this species was given to me by Dr. Debski—on *Cleome arabica* coll. Helwan 5.2.08, on *Cressa cretica* coll. Helwan 25.12.08 and on *Frankenia pulverulenta* coll. Helwan 7.6.10. Later he very kindly gave me fresh material on *Cleome arabica* Helwan 6.12.24 and 20.2.25, on *Zygophyllum* sp. Helwan 20.2.25. It has been found at the edge of the desert at Masara on *Alhagi maurorum* (Taha) 21.2.26 and 12.4.26, and on *Fagonia mollis* 12.4.26 and *Fagonia arabica* 12.4.26 at the same place by the same collector. I have also collected it on *Zygophyllum* sp. near the top end of Wadi Suarka 24.2.26, in Wadi Ghorab 7.3.26 and on *Cleome trinervia* in Wadi Askhar North 27.2.26 and Wadi Araba 4.3.26.

4. PHENACOCOCCUS ZILLAE HALL.

BIBLIOGRAPHY :

Hall, Min. of Agric. Bull. No. 72, p. 5, (1926)

HOST PLANT.

Cruciferæ

Zilla spinosa.

PART OF PLANT ATTACKED.

The small branches.

DISTRIBUTION.

Fayed near Suez.

DESCRIPTION.

Adult female oval, greyish yellow, with moderate amount of mealy secretory matter. Segmentation indistinct. Body very soft. Ovisac elongate with fibres composing it slightly elastic. Eggs and larvæ pale brown.

REMARKS.

Only collected once in the desert at Fayed near Suez 5.10.25 (Housni). It seems likely that this is not a very common species as the host plant is a common desert shrub and has been examined on very many occasions. The microscopic characters of this species are very marked.

5. *PSEUDOCOCCUS ALHAGII* HALL.

BIBLIOGRAPHY :

Hall, Min. of Agric. Bull. No. 72, p. 7, (1926).

HOST PLANT.

Compositæ

Echinops spinosus.

Leguminosæ

Alhagi maurorum.

PART OF PLANT ATTACKED.

On the aerial growth of *ECHINOPS* and the roots of *ALHAGI*.

DISTRIBUTION.

On the edge of the desert near Heliopolis and Massara.

DESCRIPTION.

Adult female ovale in outline colour usually pinkish but some examples straw coloured. Mealy secretory matter sparse but evenly distributed.

Segmentation distinct. Marginal filaments confined to the last two abdominal segments the caudal pair being $\frac{1}{3}$ the length of the body. No ovisac was observed.

Length of adult female 2.5-3.5 mm. Breadth 1.75-2.5 mm.

REMARKS.

Collected at the edge of the desert at Masara (Taha) 26.2.26 and at the same place (Taha) 5.4.26. It was later collected in the desert near Heliopolis on the roots of an unknown plant 18.4.26 (Taha).

6. *RIPERSIA ARTEMISIAE* HALL.

BIBLIOGRAPHY :

Hall, Min. of Agric. Bull. No. 72, p. 10, (1926).

HOST PLANT.

Chenopodiaceae *Artemisia monosperma*.

PART OF PLANT ATTACKED.

The roots.

DISTRIBUTION.

The Suez Road.

DESCRIPTION.

Adult female broadly ovate varying from dull rose to a palish dirty yellow green in colour ; specimens of the latter hue predominate and have a somewhat waxy hue. Covering of white secretory matter thin. Marginal filaments wanting. Just prior to oviposition the adult female becomes entirely enclosed

in a thin leathery sac within which the eggs are laid.
Eggs yellowish.

Length of adult female 2.5-3 mm. Breadth 2-2.5 mm.

REMARKS.

This has only been collected on one occasion on the roots of the host plant mentioned at the 6th Tower Suez Road 5.4.25 (Efflatoun). It seems unlikely that it is a common species or it would have been found again.

7. **ACLERDA PANICI** HALL.

BIBLIOGRAPHY :

Hall, Min. of Agric. Bull. No. 72, p. 12, (1926).

HOST PLANT.

Gramineæ

Panicum turgidum.

PART OF PLANT ATTACKED.

The parent stem beneath the leaf sheaths.

DISTRIBUTION.

The Suez Road.

DESCRIPTION.

The true characters of the living insect not certain. All the specimens collected were dark brown and naked with the exception of either a nymph or young adult female that was flesh coloured with a tinge of mauve.

Length of old adult female 3.5-4.5 mm. Breadth 2-2.5 mm.

REMARKS.

The presence of this species was first pointed out to me by Mr. Green who found a single specimen on some *Panicum turgidum* infected with *Odonaspis panici* HALL that I had sent him. This material had been collected between the 4th and 5th Towers on the Suez Road on 8.12.25. The PANICUM at the same spot was carefully examined on 29.3.26 with the result that 2 old adult females (one containing larvæ) 2 young adults and 1 nymph were taken.

I should not be surprised to find this species widely distributed.

8. CTENOCHITON ARTEMISIAE HALL.

BIBLIOGRAPHY :

Hall, Min. of Agric., Bull. No. 72, p. 15 (1926).

HOST PLANT.

Compositae

Artemisia judaica.

PART OF PLANT ATTACKED.

The roots.

DISTRIBUTION.

Very common in the wadis east of Beni Suef.

DESCRIPTION.

Adult female broadly ovate, highly convex and dull green in colour. Dorsum moderately leathery speckled with small patches of glassy matter. These patches are small and not conspicuous but they give a speckled and rugose appearance to the dorsum.

Young stages flattish grass green with broad median longitudinal carina the colouration being slightly deeper in the grooves on either side of the carina.

Length of adult female 2,5-3,5 mm. Breadth 1.75-2.5 mm.

REMARKS.

This species was found to be very common on the roots of *A. judaica* at the end of February and beginning of March 1926 in the wadis east of Beni Suef. It was collected in Wadis Sennur, Askhar North, Askhar South, Araba, Abu Rimh, Ghorab, etc.

9. **CTENOCHITON HALOXYLONI** HALL.

BIBLIOGRAPHY :

Hall, Min. of Agric., Bull. No. 72, p. 16 (1926).

HOST PLANT.

Chenopodiaceæ

Haloxylon schweinfurthii.

PART OF PLANT ATTACKED.

The roots.

DISTRIBUTION.

Widely distributed.

DESCRIPTION.

Adult female broadly ovate to circular in outline, highly convex almost hemispherical. Ventral surface flat. Margin with a series of stout rays some of which are often broken off in old adults. Dorsum rugose with a submarginal suture that runs posteriorly into the anal plates. Dorsum with waxy plates each plate being mound shaped and surrounded by a little ir-

regularly shaped glassy mass suggesting granulated sugar. The plates themselves appear to have some sort of arrangement but this is obscure. The granular masses surmounting the plates give a characteristic appearance. Anal plates dark brown. General colouration of dorsum grey with a tinge of yellow green, in some specimens pink. Old adult females turn darker in colour.

Dorsal dermis very leathery. Ventral dermis with abdominal segmentation very marked in the median area, the submarginal region is without any trace of segmentation but with an inward fold at the junction with the median area. Ventral tissues extremely soft and easily ruptured. Stigmatic pores discernible by a little white secretory matter. Boiled in potash the insect gives a bottle green colouration to the solution.

Diameter of adult female 2.5-3.5 mm.

REMARKS.

Collected in large numbers between the 5th and 6th Towers Suez Road 8.12.25. Later it was found on the same host plant in Wadi Araba (65 miles east of Beni Suef) on 3.3.26.

10. *FILIPPIA EPHEDRAE* NEWST.

ENTOMOGRAPHY :

- Newstead, Ent. Mon. Mag. Vol. XXXVII, p. 83 (1901).
Lindinger, Die Schildlaus, p. 140, (1912).
Hall, Min. of Agric. Bull. No. 22, p. 20, (1922).
Hall, Min. of Agric. Bull. No. 36, p. 40, (1923).
Hall, Min. of Agric. Bull. No. 64, p. 19, (1925).
Hall, Min. of Agric. Bull. No. 72, p. 29, (1926).

HOST PLANT.

Gnetaceæ

Ephedra alte.

PART OF PLANT ATTACKED.

Aerial.

DISTRIBUTION.

Widely distributed. Recently collected in Palestine.

DESCRIPTION.

Female ovisac pure white and very closely felted; very elongate transversely and longitudinally convex or boat shaped.

Adult female yellow green to brown green entirely enclosed at the period of gestation. Eggs pale sepia to pink.

Length of fully developed ovisac 6-10 mm.

Breadth 2-3 mm. Greatest height 2-3,5 mm.

REMARKS.

This species was originally described by Newstead (*l.c.*) from material collected on *Ephedra alte* in Wadi Gerrawi near Helwan by Admiral Bloomfield in 1900. My material is all from the same host plant, near Helwan 24.4.20, near Helwan Feb. 1925 (Debski), Wadi Sheikh Salama 29.4.25, near Wadi Sennur 25.2.26, Wadi Nashash 4.3.26, near Wadi Abu Rimh 5.3.26, Wadi Ghorab 6.3.26. It was found to be very common in these wadis east of Beni Suef; the specimens were practically all adult females either in the process of egg laying or having just completed it and the young larvæ hatching out.

I have recently heard from Dr. Bodenheimer

that he has collected it in Palestine on *Asparagus* sp.

11. **PULVINARIA DISCOIDALIS** HALL.

BIBLIOGRAPHY :

Hall, Min. of Agric. Bull. No. 36, p. 16, (1923).

Hall, Min. of Agric. Bull. No. 72, p. 31, (1926).

HOST PLANTS.

Chenopodiaceæ

? *Anabasis articulata*

? *Haloxylon articulatum*.

Haloxylon schweinfurthii.

PART OF PLANT ATTACKED.

Aerial.

DISTRIBUTION.

Widely distributed.

DESCRIPTION.

Adult female approximately circular frosted green in colour due to a little white secretionary matter. Ovisac large approximately circular with a smooth matted surface. The adult female looks like a disc let into the ovisac.

Diameter of adult female 1.25-1.5 mm.

REMARKS.

The original material was collected on an unknown host plant at the 7th Tower Suez Road (Al-fieri) on 12.10.21. It was collected again on the Suez Road on ? *Anabasis articulata* (Kirkpatrick) 3.9.23 and between the 6th and 7th Towers Suez Road (Kirkpatrick) 16.10.23. On *Haloxylon* ? *articulatum* in Wadi Gharba 30.4.25, on ? Kassanein near Tel el Kebir (Kasem) 4.8.25, on *Haloxylon schweinfurthii* be-

tween the 4th and 5th Towers Suez Road 8.12.25, Wadi Rod el Hamar at the top of Wadi Digla (Simpson) 19.12.25, Wadi Araba 4.3.26 and near the top end of Wadi Suarka 24.2.26.

12. PULVINARIA RETAMAE HALL.

BIBLIOGRAPHY :

- Hall, Min. of Agric. Bull. No. 36, p. 17, (1923).
Hall, Min. of Agric. Bull. No. 72, p. 31, (1926).

HOST PLANTS.

Compositæ	<i>Artemisia monosperma.</i>
Leguminosæ	<i>Retama rætam.</i>
Umbelliferæ	<i>Pithyranthus tortuosus.</i>

PART OF PLANT ATTACKED.

Aerial.

DISTRIBUTION.

Widely distributed.

DESCRIPTION.

Adult female yellow green to grass green, convex and ovoid. Ovisac white of a type similar to that of *P. mesembrianthemis* VALL. with a closely matted smooth surface. Faint transverse striations are sometimes present and in a few cases faint longitudinal striations giving a delicate fluting.

Length of adult female 4 - 4.5 mm. Breadth 3 - 3.5 mm.

REMARKS.

The original material was collected on *Retama rætam* at the 7th Tower Suez Road (Alfieri) on 17.10.21. Later additional specimens were found

amongst some old unidentified material in the Ministry's collections on ? Abu Roash-Western Desert — (Bolland) 25.4.14, on *Pithyranthus tortuosus* Wadi Tureit Rashid (Adair) 29.5.19, on ? locality ? (Adair) 22.4.21 Dr. Debski gave me some material from his collection 29.4.24 collected on *Retama raelam* on the Suez Road. On *Pithyranthus tortuosus* Wadi Ibtadi 29.4.25 and 3.5.25, Wadi Gerrawi 6.5.25. It was common on *PITHYRANTHUS* in the two last named wadis but was in no case found on *RETAMA*. On *Artemisia monosperma* 6th Tower Suez Road 6.4.25, Wadi Hof 1.2.26 (Kasem).

It appears to be commonest on *Pithyranthus tortuosus*.

13. *ASPIDIOTUS ARTEMISIAE* HALL.

BIBLIOGRAPHY :

Hall, Min. of Agric. Bull. No. 72, p. 20, (1926).

HOST PLANTS.

Compositæ

Achillea fragrantissima.

Artemisia judaica.

Artemisia monosperma.

PART OF PLANT ATTACKED.

Found on the roots but in cases of heavy infection specimens may be found low down on the aerial growth.

DISTRIBUTION.

Widely distributed.

DESCRIPTION.

Scale of adult female highly convex but approxi-

mately circular in outline. Pellicles usually eccentric pale green in colour this colour being obscured by a film of white secretory matter. The area surrounding the 2nd pellicle white shading off into chocolate with the margin again whitish. The general chocolate colouration with white centre is conspicuous in most examples but in some cases the chocolate colouration is only faintly developed whilst in others it is entirely absent rendering the scale uniformly white. Ventral scale entire, dense white, usually remaining attached to the host plant or at least the median portion of it by which it is attached to the plant. In a few cases the ventral scale came away entire with the dorsal scale.

Adult female very pale green.

Male scale white with pellicle greenish obscured by white secretory matter.

Diameter of scale of adult female 1.25 - 1.5 mm.

REMARKS.

The original material of this species consisted of a few specimens found on the aerial growth of some very small and stunted *Artemisia monosperma* shrubs between the 4th and 5th Towers Suez Road on 8.12.25. Later it was found in small numbers on the roots of *Achillea fragrantissima* near the top end of Wadi Suarka and finally in large numbers on *Artemisia judaica* near the top end of Wadi Suarka on 25.2.26, Wadi Askhar North 27.2.26 and Wadi Askhar South 2.3.26. In these cases the attack was chiefly confined to the roots but where the infection was heaviest the insects were found also on the aerial growth.

One lot of material from Wadi Askhar North although externally identical with *A. artemisiae* was found on microscopic examination to be *Targionia nigra* SIGN.

14. **ASPIDIOTUS HERZLIANUS** BOD.

BIBLIOGRAPHY :

- Bodenheimer, Cocc. of Palestine, Zionist, Agric.
Expt. Station, Bull. No. 1, p. 30, (1924).
Hall, Min. of Agric. Bull. No. 72, p. 21, (1926).

HOST PLANT.

Umbelliferæ

Pithyranthus tortuosus.

PART OF PLANT ATTACKED.

The stems.

DISTRIBUTION.

Wadi Ibtadi and Palestine.

DESCRIPTION.

Egyptian examples show the scale of the adult female circular, pale grey brown in general colouration, with orange pellicles. Ventral scale thin, white, remaining adherent to the host plant when the scale is removed.

Diameter of scale of adult female 1 - 1.25 mm.

REMARKS.

Collected in Wadi Ibtadi 4.5.25. The infection was confined to the aerial growth and was heavy. It is curious that it has only been collected on this one occasion and that the other clumps of *PITHYRANTHUS* in the vicinity were apparently free from infection.

This species was originally described from speci-

mens taken on *Asparagus aphyllus*, also a desert plant, in Palestine. I have since received specimens from Palestine from Dr. Bodenheimer on *Ephedra campylopoda* Beth Djemal 13.4.25 and on *Asparagus acutifolius* Ain Fara, April 1926.

15. CHIONASPIS NOAEAE HALL.

BIBLIOGRAPHY :

- Hall, Min. of Agric. Bull. No. 64, p. 13, (1925).
Hall, Min. of Agric. Bull. No. 72, p. 33, (1926).

HOST PLANTS.

Chenopodiaceæ

Anabasis articulata.

Haloxylon schweinfurthii.

Noëa mucronata.

Gramineæ

Panicum turgidum.

PART OF PLANT ATTACKED,

Aerial.

DISTRIBUTION.

Widely distributed and Wadi el Arish, Sinai.

DESCRIPTION.

Scale of adult female pear shaped, opaque white, and convex. First pellicle yellow, second straw coloured, both thinly covered with white secretory matter. Ventral scale entire but very thin, remaining attached to the host plant as a thin white film.

Male scale snowy white, elongate, with sides subparallel; median carina marked but lateral carinae poorly represented. Pellicle straw coloured.

Length of scale of adult female 1.5 mm. Breadth 1 mm.

REMARKS.

The original material of this species was collected on *Noaa mucronata* in Wadi el Arish, Sinai (Clayton) on 27.12.23. There were very few specimens on this but abundant material was found on *Panicum turgidum* at Ein Musa near Cairo (Taha) on 18.3.25. A few specimens were found on *Haloxylon schweinfurthii* in Wadi Askhar North on 28.2.26 and Wadi Askhar South 3.3.26 and a relatively heavy infection on a bush of *Anabasis articulata* in Wadi Askhar North on 28.2.26. A single specimen was taken on *Panicum turgidum* in Wadi Araba 4.3.26 and abundant material on the same host plant in the desert near Helio-
polis 18.2.26.

16. COCCOMYTIUS FARSETIAE HALL.

BIBLIOGRAPHY :

Hall, Min. of Agric. Bull. No. 72, p. 23, (1926).

HOST PLANT.

Cruciferae

Farsetia aegyptiaca.

PART OF PLANT ATTACKED.

Aerial.

DISTRIBUTION.

On the edge of the desert near Masara.

DESCRIPTION.

Scale of adult female large, broadly pyriform in outline and unusually convex. First pellicle usually bare and straw coloured, second pellicle orange but obscured by secretionary matter. General colouration of scale a drab dust colour. Ventral scale thin but

entire coming away usually with the dorsal scale.

Length of scale of adult female 2.5-3.25 mm.
Breadth 1.5-2 mm.

REMARKS.

Only collected once on the edge of the desert at Massara (Taha) 6.4.26. A large and easily recognizable species.

17. **COCCOMYTILUS RETAMAE** HALL.

BIBLIOGRAPHY :

Hall, Min. of Agric. Bull. No. 72, p. 24, (1926).

HOST PLANT.

Leguminosæ

Retama retam.

PART OF PLANT ATTACKED.

The young stems.

DISTRIBUTION.

Widely distributed and also found in Palestine.

DESCRIPTION.

Scale of adult female small, ovoid, narrowed in front broadest across the middle rounded behind. General colouration a dull dark brown darkest in the middle and shading off through a paler reddish brown to very pale almost white behind. The scale is covered by a thin film of white secretionary matter; the pellicles are very large and heavily chitinized and shiny reddish brown in colour. The 1st pellicle is very nearly $1/2$ as long as the 2nd pellicle which is very nearly as large as the whole scale.

Male scale white with straw coloured almost golden pellicle, narrow and slightly expanded behind.

Length of scale of adult female 0.75-1 mm.

REMARKS.

A heavy infection was found on a bush in Wadi Ibtadi on 3.5.25. It has also been collected in small numbers near the top end of Wadi Suarka on 24.2.26 and in Wadi Araba 26.2.26.

I have recently received the same species on the same host plant from Dr. Bodenheimer collected in Palestine near Jericho.

18. **ODONASPIS PANICI** HALL.

BIBLIOGRAPHY :

Hall, Min. of Agric. Bull. No. 72, p. 26, (1926).

HOST PLANT.

Gramineæ *Panicum turgidum.*

PART OF PLANT ATTACKED.

The main stem sheltered by the enveloping leaf-sheath.

DISTRIBUTION.

Widely distributed.

DESCRIPTION.

Scale of adult female large, elongate, broadened in front and somewhat narrowed behind. Flattish and white in colour. Pellicles near one end naked and orange. Ventral scale entire, dense white and continuous with the dorsal scale. Where the specimens are

crowded the scales are fused at their edges forming one mass.

Male scale smaller elongate with subparallel sides. Pellicle orange. Width of scale rather more than the width of the pellicle.

Length of scale of adult female 2.5-3mm. Breadth 1.5-1.75 mm.

Length of scale of male 1 mm. Breadth 0.5 mm.

REMARKS.

The original material was collected at Abu Sueir (Housni) June 1925. It has since been found to be common on the Suez Road and in the wadis to the east of Beni Suef.

19. *PARLATORIA EPHEDRAE* LIND.

BIBLIOGRAPHY :

Lindinger, Zeitschr. f. wiss. Insektenbiol. VII, 4, p. 129 (1911).

Hall, Min. of Agric. Bull. No. 64, p. 16, (1925).

HOST PLANT.

Gnetaceæ

Ephedra alle.

PART OF PLANT ATTACKED.

The small stems.

DISTRIBUTION.

Wadi Hof and Persia.

DESCRIPTION.

A small oval species tapering off somewhat posteriorly. The 1st pellicle is bare and apical, the 2nd is large occupying, in Egyptian examples at least three quarters of the whole puparium. Secretionary

matter white. The colour of the pellicles, in dead examples, is dark green but that of the 2nd pellicle is somewhat obscured by the white secretionary matter.

In general appearance it resembles a small *Parlatoria blanchardii* TARG.

Length of scale of adult female 1 mm. Breadth 0.5 mm.

REMARKS.

I have never collected this species. Dr. Debski gave me a little material collected in Wadi Hof on 31.5.19 and I found a little in the Ministry's collections collected 29.5.19 in Wadi Um Elek (Adair). According to Dr. Debski it is probable that both lots of material came from the same plant.

This species was originally described by Dr. Lindinger from material collected in Persia.

20. PINNASPIS BILOBIS NEWST.

BIBLIOGRAPHY :

- Newstead, Ent. Mon. Mag. Vol. XXXI, p. 233, (1895).
- Hall, Min. of Agric. Bull. No. 22, p. 28, (1922).
- Hall, Min. of Agric. Bull. No. 36, p. 44, (1923).
- Hall, Min. of Agric. Bull. No. 64, p. 19, (1925).
- Hall, Min. of Agric. Bull. No. 72, p. 30, (1926)

HOST PLANTS.

Gramineæ	<i>Panicum turgidum.</i>
Resedaceæ	<i>Ochradenus baccatus.</i>
Umbelliferæ	<i>Pithyranthus tortuosus.</i>

PART OF PLANT ATTACKED.

Aerial.

DISTRIBUTION.

Widely distributed also occurring in Algeria and Palestine.

DESCRIPTION.

Puparium of adult female, opaque white, somewhat polished, very convex and broadly pyriform, widening considerably immediately behind the second pellicle. Pellicles, pale yellow, usually covered by a thin layer of white secretionary matter.

Length of scale of adult female 1.5 mm. Breadth 0.75 mm.

REMARKS.

Only collected once on *OCHRADENUS* near Helwan 20.8.23. Common on *PITHYRANTHUS* in Wadis Digla, Hof, Gerrawi, Ibtadi and at Mehatta Mashkara, and Ein Musa. It was found to be rare in the wadis east of Beni Suef only being taken once near the top end of Wadi Suarka. It has been collected twice on *Panicum turgidum*.

Originally described from Algeria on *Deverra scoparia* (UMBELLIFERAE). I have received what I take to be the same species on *Globularia alypum* (GLOBULARIACEAE) from Mr. Balachowsky from the same country and Dr. Bodenheimer tells me he has collected it on *Fœniculum vulgare* (UMBELLIFERAE) in a little wadi near Ain Harod (Palestine).

21. PINNASPIS ZILLAE HALL.

BIBLIOGRAPHY :

- Hall, Min. of Agric. Bull. No. 36, p. 27, (1923).
Hall, Min. of Agric. Bull. No. 64, p. 22, (1925).
Hall, Min. of Agric. Bull. No. 72, p. 32, (1926).

HOST PLANTS.

Asclepiadaceæ	<i>Dæmia tomentosa.</i>
Boraginaceæ	<i>Trichodesma africana.</i>
Crassulaceæ	<i>Telephium sphærospermum.</i>
Cruciferæ	<i>Farsetia ægyptiaca.</i>
	<i>Zilla spinosa.</i>
Resedaceæ	<i>Ochradenus baccatus,</i>
	<i>Reseda pruinosa.</i>
Rutaceæ	<i>Haplophyllum halipensis.</i>
Umbelliferæ	<i>Pithyranthus tortuosus.</i>

PART OF PLANT ATTACKED.

Aerial.

DISTRIBUTION.

Widely distributed and also occurring in Palestine.

DESCRIPTION.

Scale of adult female approximately circular or broadly ovate, opaque white, very convex. First pellicle yellow, second pellicle straw coloured, both thinly covered with white secretionary matter. Ventral scale very thin, remaining attached to the host plant.

Male scale snowy white, narrow, elongate, with sides subparallel; median carina usually present, lateral carinae wanting. Pellicle yellow.

Diameter of scale of adult female 0.8-1.0 mm.

REMARKS.

Probably the commonest species to be found in the desert. Heavy attacks have been found on *Zilla spinosa*, *Dæmia tomentosa*, *Ochradenus baccatus* and *Pithyranthus tortuosus*.

I have also received material from Palestine from

Dr. Bodenheimer on *Osyris alba* (SANTALACEÆ) and
Calotropis procera (ASCLEPIADACEÆ).

22. TARGIONIA HALOXYLONI HALL.

BIBLIOGRAPHY :

Hall, Min. of Agric. Bull. No. 72, p. 27, (1926).

HOST PLANT.

Chenopodiaceæ *Haloxylon schweinfurthii*.

PART OF PLANT ATTACKED.

Aerial and subterranean — chiefly the latter.

DISTRIBUTION.

Widely distributed.

DESCRIPTION.

Scale of the adult female small irregularly circular, convex, dead white in colour owing to a thick covering of white secretionary matter. The 1st pellicle is straw coloured when denuded and the 2nd large and black. The white secretionary matter is easily knocked off coming away in one piece and revealing the black nymphal pellicle. It is this fact which makes the scale easy to detect, if it were not so they would be difficult to see. Both the 2nd pellicle and adult female strongly and often asymmetrically chitinized. Ventral scale well developed but usually remaining attached to the host plant.

Diameter of scale of adult female 1.25-1.75 mm.

REMARKS.

Found to be relatively common in Wadi Askhar South on 2.3.26, Wadi Araba 3.3.26 and Wadi Sennur

5.3.26, and later between the 5th and 6th Towers Suez Road in April 1926.

Part II.

Species not apparently confined to the desert.

Many of the species recorded here have their natural habitat in the cultivated area but have managed to adapt themselves to desert conditions owing to the presence of suitable host plants. Those species which are established or likely to be found to become established in the desert are marked with an asterisk.

1. * *NAIACOCCLUS SERPENTINUS* VAR. *MINOR* GREEN.

BIBLIOGRAPHY :

- Green, Records, Ind. Mus. Vol. XVIII, Part II, p. 117, (1919).
Hall, Min. of Agric. Bull. No. 36, p. 3, (1923).
Hall, Min. of Agric. Bull. No. 64, p. 20, (1925).

HOST PLANT.

Tamaricaceæ *Tamarix* spp.

PART OF PLANT ATTACKED.

Aerial.

DISTRIBUTION.

Both Eastern and Western Deserts, El Arish (Sinai), Palestine, Eastern Persia and Baluchistan.

DESCRIPTION.

Adult female occupying the extremity of a very long white tubular ovisac which either forms a

simple loop or in crowded examples irregular coils. Adult female removed from the ovisac dull slaty grey or purplish brown.

Length of ovisac 1.25-1.75 inches.

REMARKS.

This species has been found to attack TAMARIX trees growing in the desert usually at no very great distance from cultivation. It is common near Kharga Oasis and Baharia Oasis and has been collected at El Arish (Sinai), Abu Sueir, and Geneife.

2. PHENACOCCLUS CYPERI HALL.

BIBLIOGRAPHY :

Hall, Min. of Agric. Bull. No. 72, p. 4, (1926).

HOST PLANT.

Cyperaceæ

Cyperus sp.

PART OF PLANT ATTACKED.

Under the leaf sheath.

DISTRIBUTION.

Kharga Oasis.

DESCRIPTION.

The material of this species was brought in spirit and so the characters of the living insect cannot be given.

REMARKS.

Only collected once on the edge of the desert at Kharga Oasis (Taha) 10.12.25.

Although *Phen. cyperi* HALL has not yet been collected in the cultivated area I should expect to find

it there rather than in the desert. A careful examination of Kharga Oasis may prove it to be indigenous to the Oasis.

3. *PSEUDOCOCCUS BROMELIAE* BOUCHÉ.

BIBLIOGRAPHY :

- Brain, Trans. Roy. Soc. South Africa, Vol. V, Part 2, p. 109, (1915).
Green, Cocc. of Ceylon, Part V, p. 381, (1922).
Hall, Min. of Agric. Bull. No. 36, p. 4, (1923).
Hall, Min. of Agric. Bull. No. 72, p. 30, (1926).
Willcocks, Insect and Rel. Pests of Egypt, Sult. Agric. Soc. Bull. No. 2, p. 323, (1925).

HOST PLANTS.

- | | |
|---------------|------------------------------|
| Convolvulaceæ | <i>Cressa cretica</i> . |
| Gramineæ | <i>Sporobolus spicatus</i> . |

PART OF PLANT ATTACKED.

The roots.

DISTRIBUTION.

Edge of the desert at Khanka.

DESCRIPTION.

Adult female very pale pink or greyish with a thin covering of white powdery secretory matter, margin with short stout filaments. Segmentation distinct. Body broadly ovate, convex and tumescent above with flattened ventral surface.

Length of adult female 2-2.5 mm. Breadth 1.5-1.75 mm.

REMARKS.

This cosmopolitan species that is relatively com-

mon in the Nile Valley was collected at the edge of the desert at Khanka (Taha) 24.4.26.

4. PSEUDOCOCCUS VARIABILIS HALL.

BIBLIOGRAPHY :

Hall, Min. of Agric. Bull. No. 46, p. 5, (1924).

Hall, Min. of Agric. Bull. No. 64, p. 23, (1925).

HOST PLANT.

Gramineæ

Sporobolus spicatus.

PART OF PLANT ATTACKED.

The roots.

DISTRIBUTION.

Edge of the desert at Khanka.

DESCRIPTION.

Adult female elongate ovate, yellowish, rather thickly covered with mealy secretory matter with regular short filaments set round the margin. Caudal filaments three times as long as the marginal filaments.

Shape of ovisac uncertain but surface very loosely matted showing the eggs within. Eggs yellow.

Length of adult female 2.5-3.25 mm. Breadth 1.5-2 mm.

REMARKS.

This species that is relatively common in the Nile Valley has been collected on the edge of the desert at Khanka (Taha) on 5.4.26.

5. * **RIPERSIA CELLULOSA** HALL.

BIBLIOGRAPHY :

Hall, Min. of Agric. Bull. No. 36, p. 7, (1923).

Hall, Min. of Agric. Bull. No. 72, p. 30, (1926).

HOST PLANTS.

Gramineæ

Andropogon sp.

Imperata cylindrica.

PART OF PLANT ATTACKED.

Under the leaf sheaths.

DISTRIBUTION.

Wadis Digla and Gerrawi and the Mokattam Hills (Eastern Desert); near the Pyramids (Western Desert).

DESCRIPTION.

Adult female large, elongate ovate, delicate pink in colour, covered with a little white pulverulent secretory matter. Marginal filaments wanting. Ovisac composed of ductile filaments. Eggs pale yellow to pale straw coloured. Dried specimens of the adult female are straw coloured.

Length of adult female 3.5 mm. Breadth 1.5-2.5 mm.

REMARKS.

R. cellulosa is very common on *Imperata cylindrica* in the Nile Valley. It has been collected on the same host plant in Wadi Digla 26.3.23, near the Mokattam Hills 13.2.26 and near the Pyramids (Western Desert) on 22.1.26. It was collected once on *ANDROPOGON* in Wadi Gerrawi 29.8.25.

6. RIPERSIA INTERNODII HALL.**BIBLIOGRAPHY :**

- Hall, Min. of Agric. Bull. No. 36, p. 8, (1923).
Hall, Min. of Agric. Bull. No. 64, p. 20, (1925).
Hall, Min. of Agric. Bull. No. 72, p. 30, (1926).
Willcocks, Insect and Rel. Pests of Egypt, Sult.
Agric. Soc. Bull. No. 2, p. 314, (1925).

HOST PLANT.

Gramineæ *Sporobolus spicatus.*

PART OF PLANT ATTACKED.

The roots.

DISTRIBUTION.

The edge of the desert near Khanka.

DESCRIPTION.

Adult female superficially not unlike *P. sacchari* CKLL. but usually smaller, less elongate and of a darker pink almost violet colour.

Length of adult female 3.5-4.5 mm. Breadth 2-2.5 mm.

REMARKS.

This is not a common species even in the Nile Valley. It has only been collected once in the desert near Khanka (Taha) on 5.4.26.

7. TRIONYMUS MASRENSIS HALL.**BIBLIOGRAPHY :**

- Hall, Min. of Agric. Bull. No. 64, p. 10, (1925).

HOST PLANT

Gramineæ *Imperata cylindrica.*

PART OF PLANT ATTACKED.

The roots.

DISTRIBUTION.

Kharga Oasis.

DESCRIPTION.

Adult female pale pink sparsely covered with white pulverulent matter. Segmentation of the abdomen very distinct. Marginal and caudal filaments wanting.

Shape of the ovisac not apparent but the filaments composing it are capable of being considerably drawn out.

Eggs pale yellowish pink.

Length of adult female 2.5-3.5 mm. Breadth 1.25-1.5 mm.

REMARKS.

This species has only been collected once near the edge of the desert at Kharga Oasis (Housni) on 5.II.24. It is possible that it is indigenous to Kharga Oasis.

8. * LEGANIODIASPIS AFRICANA NEWST.

BIBLIOGRAPHY :

- Newstead, Bull. Ent. Res. Vol. II, p. 100, (1911-12).
- Lindinger, Die Schildlaus, pp. 52 and 156, (1912).
- Willcocks, Sult. Agric. Soc. Bull. No. 1, (1922), various records.
- Hall, Min. of Agric. Bull. No. 22, p. 7, (1922).
- Hall, Min. of Agric. Bull. No. 36, p. 33, (1923).
- Hall, Min. of Agric. Bull. No. 64, p. 18, (1925).
- Hall, Min. of Agric. Bull. No. 72, p. 29, (1926).

HOST PLANT.

Leguminosæ

Acacia tortilis.

PART OF PLANT ATTACKED.

Aerial.

DISTRIBUTION.

Wadi Askhar South.

DESCRIPTION.

Young adult female dusky red brown, brown, or smoky brown, generally protected by a thin coating of grey or ochreous and somewhat granular secretion. Rather elongate and shaped somewhat like a *LECANIUM*; dorsum with a very pronounced keel, at the base of which is a regular series of short transverse ridges, interrupted in the centre by a deep longitudinal groove.

The female ovisac is very closely felted and straw coloured. Form short ovate and very highly convex; posterior half with a faint trace of a short median ridge, but this is, in old examples, more or less broken up into a series of faint tubercular projections; on either side of the central ridge are a number of transverse ridges, varying in intensity according to the age of the individual, but in all cases they are interrupted centrally, and in old examples they are often represented merely by minute tubercular projections.

The above is part of the original description given by Newstead (*loc. cit.*)

Male puparium white or cream coloured elongate oval.

Length of adult female 3.5-5 mm.

Length of male puparium 1.5-2 mm.

REMARKS.

It is interesting to note that this species which is relatively common on Sunt (*Acacia arabica* var *nilotica*) south of Cairo was found in Wadi Askhar North 60 miles from the nearest cultivation on 27.2.26.

9. * **CEROPLASTES AFRICANUS** GREEN.

BIBLIOGRAPHY :

- Green, Ann. Mag. N. H. (7) IV, p. 188, (1899).
Newstead, Bull. Ent. Res. Vol. II, p. 97, (1911).
Newstead, Bull. Ent. Res. Vol. IV, p. 74, (1913).
Willcocks, Sult. Agric. Soc. Bull. No. 1, pp. 257, 310, (1922).
Hall, Min. of Agric. Bull. No. 22, p. 16, (1922).
Hall, Min. of Agric. Bull. No. 36, p. 37, (1923).

HOST PLANT.

Tamaricaceæ *Tamarix* sp.

PART OF PLANT ATTACKED.

The smaller branches.

DISTRIBUTION.

Wadi Gharba.

DESCRIPTION.

The old adult female very highly convex, almost spherical except where it is in contact with the host plant; opaque waxy white with sometimes, but by no means always, a nipple shaped prominence either centrally or subcentrally. Stigmatic areas marked by slight indentations bearing opaque white points and generally faintly tinged with pink; they are very inconspicuous and only just extend beyond the margin.

The insects are usually found crowded on the

stems of the plant and the waxy covering of adjacent individuals becomes confluent rendering it difficult to ascertain the real form.

In the young adult females the nipple is always present and is quite marked whilst in very young specimens the test is almost pyramidal and suffused with pink.

Denuded of its thick coating of wax the female is shining dark brown or reddish brown.

In some cases the test of the adult female is pale maroon.

Diameter of test 6-10 mm. Height 5-8 mm.

It is probable that *C. africanus* GREEN is a synonym of *C. mimosæ* SIGN. which was also described from Egypt (Signoret. Ann. Soc. Ent. Fr. (5) II p. 46, 1872), Lindinger (Die Schildlaus p. 51, 1912) and Brain (Bull. Ent. Res. Vol. XI. p. 31, 1920) are both of the opinion that they are the same.

REMARKS.

Collected in Wadi Gharba 55 miles from the nearest cultivation on 30.4.25. Common on Sunt (*Acacia arabica* VAR. *nilotica*) and *Tamarix* in the Nile Valley.

10. CEROPLASTES RUSCI L.

BIBLIOGRAPHY :

- Newstead, Trans. Ent. Soc. London, p. 101, (1897).
- Newstead, Bull. Ent. Res. Vol. II, p. 97, (1911).
- Lindinger, Die Schildlaus, p. 214, (1912).
- Storey, List of Egyptian Insects, Min. of Agric. Bull. No. 5, p. 50, (1916).
- Leonardi, Mon. Cocc. Ital. p. 356, (1920).
- Willcocks, Sult. Agric. Soc. Bull. No. 1, (1912). Many records.

Hall, Min. of Agric. Bull. No. 22, p. 17, (1922).

Hall, Min. of Agric. Bull. No. 36, p. 38, (1923).

HOST PLANT.

Moraceæ

Ficus sycomorus.

DISTRIBUTION.

Aerial.

PART OF PLANT ATTACKED.

Branches.

DISTRIBUTION.

The test of the adult female is very highly convex, waxy white in colour, becoming almost globular late in life. The test is divided into a dome shaped central portion and eight quadrate plaques occupying the marginal area. In the centre of the dome there is a slightly depressed area reddish brown, broadly oval, in the centre of which is a small elongated raised white pad. The shallow depressed lines which subdivide the test are also of a reddish brown colour and in the centre of each plaque there is a more or less circular depression similarly coloured with one or more opaque raised white points. The stigmatic bands of opaque white wax are well marked.

In old adult females the test becomes globular, with a smooth surface and almost devoid of all signs of the characteristic plaques and pads of the earlier stages.

In dead specimens the colour tends to diffuse and the whole test to become a uniform brown.

Length 3-4.5 mm. Breadth 2-3 mm.

REMARKS.

Collected once in Wadi Hof on 22-11-24. A relatively common species in the Nile Valley.

11. * **ADISCODIASPIS TAMARICICOLA** MALEN.

BIBLIOGRAPHY :

- Malenotti, Redia, Florence, XI, No. 2, p. 309, (1916).
Hall, Min. of Agric. Bull. No. 22, p. 23, (1922).
Hall, Min. of Agric. Bull. No. 36, p. 41, (1923).
Bodenheimer, Soc. Roy. Ent. d'Egypte, p. 122, (1923).

HOST PLANT.

Tamaricaceæ

Tamarix spp.

PART OF PLANT ATTACKED.

Aerial.

DISTRIBUTION.

Wadis Digla and Abu Seria and Abu Sueir.

DESCRIPTION.

The puparium of the adult female is very strongly convex, ovate, highest convexity being in the cephalic area ; colour greyish white. The pellicles are eccentric, but within the margin ; the first pellicle is generally obliquely placed, sometimes transversely placed, on the second pellicle. The pellicles are straw coloured but are not very apparent being covered with a coating of greyish white secretory matter giving them the same appearance as the rest of the puparium.

The adult female is oval and brownish yellow.

Length of female puparium 1.5 mm.

REMARKS.

A common species in the Nile Valley. It has been

collected in Wadi Digla on 26.3.23 in Wadi Abu Seria 45 miles from the Nile Valley on 30.4.25 and at Abu Sueir on 14.6.25.

12. **CHIONASPIS STANOTOPHRI** COOLEY.

BIBLIOGRAPHY :

- Cooley, Spec. Bull. Mass. Exp. Sta. p. 35, (1899).
Hall, Min. of Agric. Bull. No. 22, p. 28, (1922).
Hall, Min. of Agric. Bull. No. 36, p. 20, (1923).
Hall, Min. of Agric. Bull. No. 64, p. 21, (1925).

HOST PLANT.

Gramineæ

Imperata cylindrica.

PART OF PLANT ATTACKED.

Aerial.

DISTRIBUTION.

Abu Roash and near the Pyramids (Western Desert).

DESCRIPTION.

Female puparium snowy white ; elongate, moderately dilated behind ; ventral scale well developed, and often coming away unbroken with the dorsal parts. First pellicle very pale transparent fulvous ; anterior margin rather deeply notched ; antennal sheaths usually bent back and lying close along the margin. Second pellicle reddish or fulvous covered by a very delicate layer of secretion appearing as fine white transverse lines ; sometimes, upon very fresh examples, three or more longitudinal white lines are noticeable, more especially in the second stage of the insect.

Length 2-3.50 mm. Breadth 0.75-1.75 mm.

Male puparium snowy white; elongate, narrow, sides nearly parallel; rather indistinctly carinate; at first thickly dusted with powdery secretion which in older examples becomes rubbed off, leaving the puparium quite smooth. Pellicle very pale fulvous, often tinged with brown.

Length averaging 1 mm.

The above is part of the original description of *Chionaspis graminis* var *divergens* GREEN (Cocc. of Ceylon Part II p. 123, 1899) with which Egyptian examples of *C. stanotophri* COOLEY are identical in external appearance. The only difference is that the male scale is often distinctly tricarinated.

REMARKS.

This species which is very common in the Nile Valley has been collected on the edge of the desert at Abu Roash on 18.2.24 and near the Pyramids on 22.1.26.

13. * *LEPIDOSAPHES BICUSPIS* HALL.

BIBLIOGRAPHY :

- Hall, Min. of Agric. Bull. No. 36, p. 22, (1923).
- Hall, Min. of Agric. Bull. No. 64, p. 22, (1925).
- Hall, Min. of Agric. Bull. No. 72, p. 32, (1926).
- Bodenheimer, Cocc. of Palestine, Zionist Agric. Expt. Sta. Bull. No. 1, p. 47, (1924).

HOST PLANT.

Tamaricaceæ

Tamarix sp.

PART OF PLANT ATTACKED.

Aerial.

DISTRIBUTION.

Wadi Sennur.

DESCRIPTION.

Scale of adult female broadened posteriorly and of somewhat irregular outline, particularly in overcrowded examples. Colour pale greenish brown. Faintly striated transversely; some examples exhibit a faintly rugose appearance. Margin flattened and translucent. Puparium waxy and semitransparent. Pellicles yellow, the second pellicle being about one quarter the length of the scale. First pellicle naked, second pellicle obscured by dusky white semitransparent secretory matter. Ventral scale thin and undivided but easily ruptured.

Male scale similar in colour and shape to that of the female but smaller.

Length of scale of the adult female 1.5-2 mm. Breadth 1-1.75 mm.

REMARKS.

Collected in Wadi Sennur at least 20 miles from the nearest cultivation on 5.3.26. It is a rare species in the Nile Valley but must be widely distributed as it has been recorded from Palestine.

14. * *LEPIDOSAPHES INTERMITTENS* HALL.

BIBLIOGRAPHY :

Hall, Min. of Agric. Bull. No. 46, p. 7, (1924).

HOST PLANTS.

Gramineæ

Panicum turgidum,
Pennisetum áichotomum.

PART OF PLANT ATTACKED.

Aerial.

DISTRIBUTION.

Wadis Digla and Nouega.

DESCRIPTION.

Scale of adult female elongate, mussel shell shaped broadening very gradually posteriorly, moderately convex and straw coloured. Pellicles straw coloured with the length of the 2nd pellicle about $\frac{1}{3}$ that of the entire scale. Secretionary covering thin and semi-transparent. Ventral scale thin and easily ruptured along the median line.

Male scale similar in colour to the female scale but much smaller and broadened very slightly behind the pellicle.

Length of scale of adult female 2-2.25mm. Breadth 1 mm.

REMARKS.

Collected on *Pennisetum dichotomum* in Wadi Digla on 26.3.23 and on *Panicum turgidum* in Wadi Nouega on 2.5.25. It is a common species in the Nile Valley ; material has also been received from Palestine.

15. * PSEUDAONIDIA GLANDULOSA NEWST.

BIBLIOGRAPHY :

- Newstead, Bull. Ent. Res. Vol. II, p. 103, (1911).
Draper, Injurious Scale Insects of Egypt, p. 11, (1907).
Lindinger, Die Schildlaus, p. 50, (1912).
Willcocks, Sult. Agric. Soc. Bull. No. 1, p. 257, (1922).

Hall, Min. of Agric. Bull. No. 22, p. 24, (1922).

Hall, Min. of Agric. Bull. No. 36, p. 42, (1923).

Hall, Min. of Agric. Bull. No. 72, p. 30, (1926).

HOST PLANT.

Leguminosæ

Acacia tortilis.

PART OF PLANT ATTACKED.

Aerial.

DISTRIBUTION.

Wadi Askhar North.

DESCRIPTION.

Puparium of adult female convex, circular straw coloured to orange in colour covered with white secretory matter. Ventral scale white, thin centrally and thick marginally. The white thickened rim remaining attached to the plant is usually conspicuous when a scale is removed. The 1st pellicle is yellow but obscured by white secretion, 2nd pellicle large. Old adult females heavily chitinized.

Diameter of female puparium 1-1.5 mm.

REMARKS.

Collected on *Acacia tortilis* in Wadi Askhar North 60 miles from the nearest cultivation on 27.2.26.

It is a common species in the Nile Valley and is known also from Palestine and South Africa.

16. * **TARGIONIA NIGRA** SIGN.

BIBLIOGRAPHY :

Signoret, Ann. Soc. Ent. Fr. (4) x, p. 106, (1870).

Leonardi, Mon. Cocc. Ital. p. 111, (1920).

Hall, Min. of Agric. Bull. No. 36, p. 29, (1923).

Hall Min. of Agric. Bull. No. 64, p. 22, (1925).

Hall, Min. of Agric. Bull. No. 72, p. 32, (1926).

HOST PLANTS.

Boraginaceæ	<i>Heliotropeum luteum.</i>
Compositæ	<i>Artemisia judaica.</i>
	<i>Launea spinosa.</i>
Cruciferae	<i>Farsetia ægyptiaca.</i>
	<i>Zilla spinosa.</i>
Cucurbitaceæ	<i>Citrullus colocynthis</i> (fruits).
Leguminosæ	<i>Alhagi maurorum.</i>
Resedaceæ	<i>Ochradenus baccatus.</i>

PART OF PLANT ATTACKED.

Aerial and subterranean — chiefly the former.

DESCRIPTION.

Widely distributed.

DESCRIPTION.

One of the most variable species in external appearance I know. The commonest form occurring in Egypt is with the scale of the adult female white or drab, convex, circular. Pellicles reddish brown obscured by a covering of opaque white or drab secretory matter. Ventral scale opaque white and well developed.

Male scale white, elongate ovate, irregular in shape with yellowish brown pellicle.

Diameter of scale of adult female 1.5-2 mm.

One very pretty and striking form occurs particularly on *Farsetia ægyptiaca*. In this form the pellicles are overlaid with dead white secretory matter the remainder of the scale being very dark brown almost black.

Another form on the roots of *Artemisia judaica* was indistinguishable from *Asp. artemisiae* HALL. In this case the pellicles are covered by white secretionary matter the area surrounding the 2nd pellicle white shading off into chocolate with the margin again whitish. The general chocolate colouration with white centre, in most examples, was conspicuous.

REMARKS.

This common European species in Egypt appears to favour the desert. It is widely distributed and occurs on a number of plants. It has only once been collected in the Nile Valley and that was on *Alhagi* growing on waste sandy soil.

Early in March 1926 a visit was paid to the St. Antonius Monastery situated in Wadi Araba under the north face of the South Galala Mountains 80 miles east of the Nile Valley and about 20 miles from the Gulf of Suez. This extremely isolated Monastery could not exist were there not a well on the premises. The water from this well is sufficient to maintain a large garden containing fruit trees, vegetables, etc. During a very cursory examination of this garden the following species were found.

Ceroplastes africanus GREEN on *Acacia farnesiana* — a heavy attack.

Sphaerococcus marlatti CKLL. on *Phœnix dactylifera*.

Parlatoria blanchardii TARG. on *Phœnix dactylifera*.

Leucaspis riccæ TARG. on *Olea europæa*.

Asterolecanium pustulans VAR *sambuci* CKLL. on
Ficus carica.

There is no doubt that all these species with the possible exception of *Cer. africanus* GREEN were introduced into the garden on plants brought from the Nile Valley.

Part III.

List of Host Plants.

A list of host plants giving the species which have been found to attack them should be useful. In many cases it will enable the species to be run down at once. The part of the plant attacked is indicated roughly — (A) aerial and (S) subterranean.

Acacia (*Leguminosæ*).

Lecaniodiaspis africana. (A)

Pseudaonidia glandulosa. (A)

Achillea (*Compositæ*).

Aspidiotus artemisiæ. (S)

Alhagi (*Leguminosæ*).

Phenacoccus inermis. (S)

Pseudococcus alhagii. (S)

Targionia nigra (A and S)

Mr. C. B. Williams informs me that he has collected *Lecanium elongatum* Sign. on *Acacia* sp. at the 3rd Tower Suez Road. I have no record of this and consequently have not included it.

- Anabasis (*Chenopodiaceæ*).
Pulvinaria discoidalis. (A)
Chionaspis noææ. (A)
- Andropogon (*Gramineæ*).
Ripersia cellulosa. (A)
- Artemisia (*Compositæ*).
Ripersia artemisiæ. (S)
Ctenochiton artemisiæ. (S)
Pulvinaria retamæ. (A)
Aspidiotus artemisiæ. (A and S)
Targionia nigra (S)
- Citrullus (*Cucurbitaceæ*).
Targionia nigra. (A)
- Cleome (*Capparidaceæ*).
Phenacoccus inermis. (S)
- Cressa (*Convolvulaceæ*).
Phenacoccus inermis. (S)
Pseudococcus bromeliæ. (S)
- Cyperus (*Cyperaceæ*).
Phenacoccus cyperi. (A)
- Daemia (*Asclepiadaceæ*).
Pinnaspis zillæ. (A)
- Echinops (*Compositæ*).
Pseudococcus alhagii. (A)
- Ephedra (*Gnetaceæ*).
Filippia ephedræ. (A)
Parlatoria ephedræ. (A)
- Fagonia (*Zygophyllaceæ*).
Phenacoccus inermis. (S)

Farsetia (Cruciferae).

- Coccomytilus farsetiae.* (A)
Pinnaspis zillæ. (A)
Targionia nigra. (A and S)

Ficus (Moraceae).

- Ceroplastes rusci.* (A)

Frankenia (Frankeniaceae).

- Phenacoccus inermis.* (S)

Gymnocarpus (Caryophyllaceae).

- Monophlebus gymnocarpi.* (A)

Haloxylon (Chenopodiaceae).

- Monophlebus gymnocarpi.* (A)
Targionia haloxyloni. (A and S)
Pulvinaria discoidalis. (A)
Chionaspis noëæ. (A)
Targionia haloxyloni. (A and S)

Haplophyllum (Rutaceae).

- Pinnaspis zillæ.* (A)

Heliotropeum (Boraginaceae).

- Targionia nigra.* (A)

Imperata (Gramineae).

- Ripersia cellulosa.* (A)
Trionymus masrensis. (S)
Chionaspis stanotophri. (A)

Launea (Compositae).

- Targionia nigra.* (A)

Nitraria (Zygophyllaceae).

- Monophlebus gymnocarpi.* (A)

Noëa (Chenopodiaceae).

- Chionaspis noëæ.* (A)

Ochradenus (Resedaceæ).

- Pinnaspis bilobis.* (A)
Pinnaspis zillæ. (A)
Targionia nigra. (A and S)

Panicum (Gramineæ).

- Antonina indica var. panica.* (A and S)
Aclerda panici. (A)
Chionaspis noææ. (A)
Lepidosaphes intermittens. (A)
Odonaspis panici. (A)
Pinnaspis bilobis. (A)

Pennisetum (Gramineæ).

- Lepidosaphes intermittens.* (A)

Pithyranthus (Umbelliferæ).

- Pulvinaria retamæ.* (A)
Aspidiotus herzlianus. (A)
Pinnaspis bilobis. (A)
Pinnaspis zillæ. (A)

Reseda (Resedaceæ).

- Pinnaspis zillæ.* (A)

Retama (Leguminosæ).

- Pulvinaria retamæ.* (A)
Coccoxylus retamæ. (A)

Sporobolus (Gramineæ).

- Pseudococcus bromeliæ.* (S)
Pseudococcus variabilis. (S)
Ripersia internodii. (S)

Tamarix (Tamaricaceæ).

- Naiacoccus serpentinus var. minor.* (A)
Ceroplastes africanus. (A)
Al-discodiaspis tamaricicola. (A)
Lepidosaphes bicuspis. (A)

- Telephium (*Crassulaceæ*).
Pinnaspis zillæ. (A)
- Trichodesma (*Boraginaceæ*).
Pinnaspis zillæ. (A)
- Zilla (*Cruciferae*).
Phenacoccus zillæ. (S)
Pinnaspis zillæ. (A)
Targionia nigra. (A and S)
- Zygophyllum (*Zygophyllaceæ*).
Phenacoccus inermis. (S)

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