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EXAMINATIONS OF THE TYPE SLIDES OF THREE DIASPIDIDAE DESCRIBED FROM JAPAN

(HOMOPTERA : COCCOIDEA)

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The 3 diaspidid scale insects treated of in this paper were originally described from Japan but have been not revised by myself; they are *Chionaspis kiushiuensis* Kuwana, *Aulacaspis wakayamaensis* Kuwana and *Aspidiotus corticispini* Lindinger. The type slides of the former 2 species were found in Kuwana's collection deposited in the Yokohama Plant Quarantine Service Station and made available for my study by Dr. K. Umeya and Mr. Y. Sekiguchi, both of the quarantine. As for the type slides of *Aspidiotus corticispini* Dr. H. Schmutterer suggested to me that I should write to Dr. H. Weidner of the Zoologisches Staatsinstitut und Zoologisches Museum at Hamburg. After his repeated locating through Lindinger's collection deposited at the museum Dr. Weidner finally found the slides and sent them to me. Here, I wish to state my hearty thanks to these gentlemen for their kind help.

The type specimens of these 3 species have lost all trace of stain. The present study was carried out exclusively making use of a phase-contrast microscope.

Chionaspis kiushiuensis Kuwana

Chionaspis kinshinensis Kuwana (sic), N. Y. Ent. Soc. Jour. 17: 155, 1909 ["Fukuoka, on the trunk of *Quercus* sp."].

Chionaspis kiushiuensis: Kuwana, Min. Agr. and Forestry, Japan, Dept. Agr. Sci. Bul. 1: 12, 1928 ["On the trunk of *Quercus gilva* (Ichii gashi) in the temple grounds of Shimogamo in Kyoto and on the same host plant in Kashii temple in Fukuoka-ken"].

I have examined 3 slides of this species, each containing one adult female. Two of these slides bear the label "*Chionaspis kiushiuensis* Kuw./Type material/on Ichii-gashi/Kashii no Miya, Fukuoka-ken/Meiji 36 nen/J. 110: 64/1260" and the other "*Chionaspis kiushiuensis*/No. 1159".

This species should be referred to *Pseudaulacaspis* and is quite close to *P. kuwanai* Takahashi (= *Phenacaspis quercus* Kuwana, 1931, nec *Chionaspis quercus* Comstock; = *Chionaspis kuwanai* Takahashi, 1953). It differs from *kuwanai* by the dorsal macroducts of the abdomen and the lateral macroducts of the thorax all fewer, but otherwise is quite close to the latter. The numbers of the dorsal macroducts of the type specimens are as in the following table.

Takahashi (1952) stated that *quercus* (= *kuwanai*) might be a form of *kiushiuensis*. I also have doubt that they are distinct species, but further examinations based on abundant material may be necessary to determine the unity of the two.

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| Specimen | Slide No. | Submedian macroducts | | | | Submarginal macroducts | | | |
|----------|-----------|----------------------|------|----|---|------------------------|------|----|---|
| | | Abd. II | III | IV | V | Abd. II | III | IV | V |
| 1 | 1260 | 0 | 1 | 2 | 2 | 2 | 6 | 5 | 4 |
| | | ? | 2 | 3 | 2 | ? | 7(?) | 5 | 5 |
| 2 | 1260 | 0 | 2 | 3 | 2 | 2 | 4(?) | 3 | 4 |
| | | 0 | 1(?) | 2 | 2 | 3 | 5 | 4 | 4 |
| 3 | 1159 | 0 | 2 | 2 | 3 | 1 | 4 | 3 | 3 |
| | | 0 | 1 | 2 | 2 | 2 | 5 | 3 | 2 |

***Aulacaspis wakayamaensis* Kuwana**

Aulacaspis wakayamaensis Kuwana, Dept. Finance, Japan, Imp. Plant Quar. Serv. Tech. Bul. 4: 33, 1926 ["On *Ischaemum antheoporoides* (Ke-kamonohashi) at Wakayama-ken"].

I have found 3 slides of this species in Kuwana's collection. Each of them contains one adult female and is labelled "1297/Ke-kamonohashi". Although no further data or designations are given on the labels, I have no doubt that these slides are comprised in the original material of *Aulacaspis wakayamaensis*.

The 3 adult females are all immature, not revealing the specific body shape at full growth. The pygidium is rather narrowly rounded, with 4 pairs of lobes. Median lobes set parallel, rather spatulate, with a pair of quite slender basal scleroses; basal

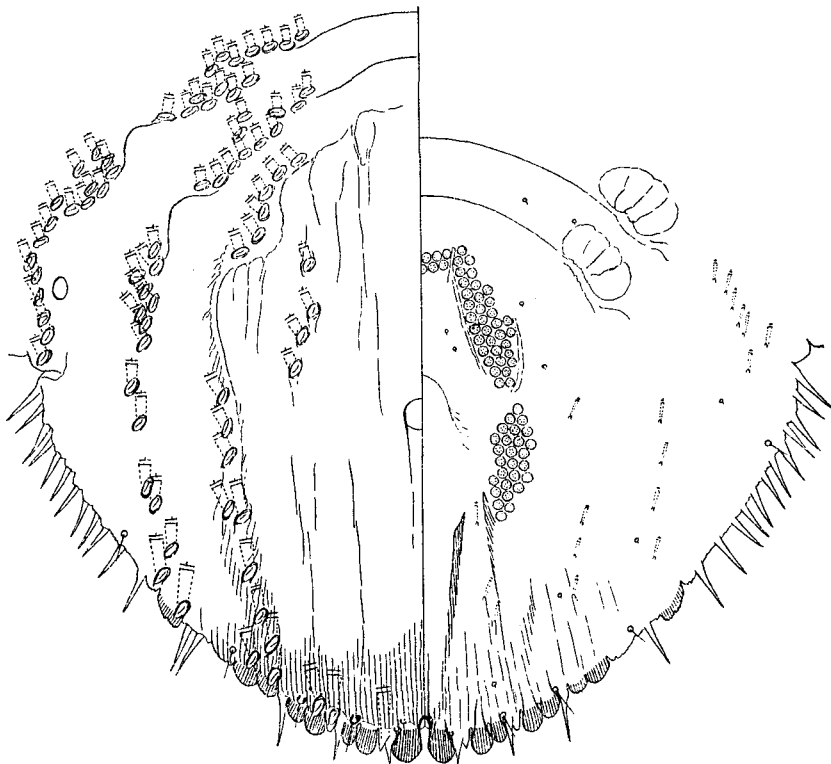


Fig. 1. *Aulacaspis wakayamaensis* Kuwana: pygidium of the adult female.

zygosis in a slender arch. Lobules of the 2nd and 3rd lobes slightly smaller than the median lobe, with slender basal scleroses. Fourth lobes also well represented in a broad prominence. Marginal gland spines of the pygidium well developed; 12-16 on the 4th abdominal segment, 1-4 on the 5th, 1 on each of the succeeding segments (6th to 8th). Second and 3rd abdominal segments each with about 15-20 gland spines on and just within the lateral margin. Submedian dorsal macroducts on the 3rd to 6th abdominal segments, in inner and outer series on the 3rd and 4th; submarginal macroducts on the 3rd to 5th. The numbers of the dorsal macroducts in the 3 type specimens are given in the following table. Second abdominal segment with 11-14 macroducts scattered in the lateral lobe, and the 3rd with 7-10.

| Specimen | Submedian macroducts | | | | | | Submarginal macroducts | | |
|----------|----------------------|------------|------------|------------|---|----|------------------------|----|----|
| | Abd. III | | IV | | V | VI | Abd. III | IV | V |
| | inner ser. | outer ser. | inner ser. | outer ser. | | | | | |
| 1 | 6 | 6 | 5 | 6 | 6 | 4 | 17 | 14 | 8 |
| | 5 | 7 | 5 | 4 | 6 | 4 | 14 | 11 | 6 |
| 2 | 8 | 9 | 4 | 9 | ? | ? | 16 | 12 | 10 |
| | 6 | 7 | 4 | 5 | 7 | 4 | 20 | 16 | 11 |
| 3 | 6 | 7 | 4 | 5 | 5 | 3 | 13 | 8 | 9 |
| | 7 | 7 | 3 | 7 | 4 | 3 | 14 | 11 | 10 |

Since the original description there has been no further authentic record of this species. Takahashi recorded the species twice from Taiwan, but both records are, after him, erroneous.

This species was supposed in my previous paper to be a member of *Miscanthaspis* Takagi. That genus was originally erected as a separation from *Aulacaspis* for the reception of *Aulacaspis kuzunoi*, which has the quadrate median lobes in the adult female and the enlarged basal antennal segment in the 1st stage larva. *Wakayamaensis* is very close to *kuzunoi* and undoubtedly should be congeneric with the latter. It differs from *kuzunoi* by the distinct 4th lobes, by the single gland spines on the 6th to 8th abdominal segments, and by the gland spines on the 2nd to 4th segments and submedian macroducts on the 3rd to 5th segments all more numerous.

The generic status of *Miscanthaspis* may, however, be not definite until all the bamboo- and grass-feeding species of *Aulacaspis* have been fully revised and compared. Through the kindness of Dr. D. J. Williams I have examined material of *Aulacaspis tegalensis* Zehntner collected in Mauritius on sugar-cane. Material of *Aulacaspis divergens* Takahashi (= *A. kuzunoi* var. *divergens*) collected on *Miscanthus* in Taiwan and Hongkong are also at hand. These species are similar to *kuzunoi* by the shape of the median lobes, but the 1st stage larvae of them have the normal basal antennal segment. I have little doubt that *tegalensis* and *divergens* are close to *kuzunoi*, while the separation of the former two from the genuine members of *Aulacaspis* is less easy. Such being the case, it seems to be better to treat *Miscanthaspis* tentatively as an infrageneric group of *Aulacaspis*.

Aspidiotus corticispini Lindinger

Aspidiotus corticis-pini Lindinger, St. f. Pflanzenschutz Hamburg, XI Bericht: 448, 1909 ["Auf

der Rinde von *Pinus densiflora* aus Japan”].

Aspidiotus corticis-pini: Lindinger, Ztschr. f. Wiss. Insektenbiol. 7: 86, 1911 [“Japan: Yokohama, auf der Rinde der Zweige von *Pinus densiflora*”].

Unaspidotus corticis-pini: MacGillivray, The Coccidae: 387 and 405, 1921.

Japaspidotus cedricola Takagi and Kawai, Insecta Matsumurana 28: 118, 1966 [“Tokyo on *Cedrus deodara* and *Tsuga diversifolia*; Simazima, Nagano-ken, on *Pinus densiflora*”]. **Syn. nov.**

I have examined 5 slides of this species; 2 of them are labelled “Syntype/No. 118 Station für Pflanzenschutz/*Aspidiotus corticis-pini* Lindgr./*Pinus densiflora*, auf Rinde der Zweige/Japan, Yokohama/30. 1. 07. Lindgr.”, 2 others “*Aspidiotus corticis-pini*/*Pinus densiflora*, Rinde/Japan, 11. 5. 1909”, and the last “*Pinus densiflora*/Japan, Yokohama/14. IV. 1910”. One of the syntypes is here designated as the lectotype.

This species was originally described from material collected in Germany on *Pinus densiflora* imported from Japan, but has been neglected for a long time by Japanese authors. Examining the slides from Lindinger’s collection I have found that *Japaspidotus cedricola* is quite identical with *corticispini*. *Cedricola* has 2 forms in regards to the dorsal macroducts of the pygidium: in one of these forms the macroducts are arranged in 2 longitudinal rows on each side, whereas in the other a short additional row is found outside the usual rows. The specimens from Lindinger’s collection all belong to the former form.

Lindinger referred *corticispini* to the “subgenus” *Morganella*, to which, however it does not belong in reality. For the reception of this species MacGillivray erected *Unaspidotus*, which is here accepted as valid. *Japaspidotus* should be sunken as a synonym of *Unaspidotus* (**syn. nov.**).

AN ADDITIONAL NOTE ON DIMORPHISM IN *CHIONASPIS NYSSAE*

By SADAŌ TAKAGI

In the foregoing paper “The genera *Chionaspis* and *Pseudaulacaspis*, with a criticism on *Phenacaspis*” (pp. 29–43) it is asserted that *Phenacaspis nyssae* (Comstock, 1881) and *Chionaspis sylvatica* Sanders (1904) belong to the same species, the former being the form associated with the leaves of the host plant and the latter with the woody parts, and also that the genus *Phenacaspis* Cooley and Cockerell (1899), of which the type-species is *nyssae*, should be sunken as a synonym of *Chionaspis* (1869). These 2 forms differ remarkably not only in the median lobes but also in the dorsal macroducts. In the leaf-feeding form the median lobes are sunken in a distinct apical notch of the pygidium, elongate and divergent, and the 6th abdominal segment is provided with dorsal macroducts in both submedian and submarginal groups. In the bark-feeding form the median lobes are quite robust, produced beyond the apex of the pygidium and basally fused together, and the 6th abdominal segment is devoid of macroducts except for the occasional presence of a single submedian macroduct.

In the foregoing paper it is shown that these forms are connected by 2 intermediate specimens collected in Arkansas, but these specimens are intermediate only in the shape