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**A new species of the genus *Lecanopsis* Targioni Tozzetti, 1868
(Hemiptera: Coccoidea: Coccidae) from the Italian peninsula:
description and remarks on its life history**

Abstract: A new species of coccoid, living on the roots of Gramineae, was found on Monte Sirino (Basilicata region, in southern Italy) and in Val Fondillo (Abruzzo region, in southern Italy). The new species is named *Lecanopsis pellizzariae* n. sp.. The most obvious characters of the new species are the non-minaret-like shape of the last marginal seta of the 1st-instar, the presence of well-developed legs in the 3rd-instar females and also, in comparison with other species of the genus *Lecanopsis* Targioni Tozzetti, 1968, the unusual increase in body size of the adult female, because of their feeding activity. All known life stages of *Lecanopsis pellizzariae* n. sp. live on stolons of Gramineae under stones. Young and small females are present in May while mature ones occur in June. Females feed on the host plant for the duration of their life cycle and enlarge in each life stage. Second instar females are present until the end of September; later, only 2nd-instar males and 3rd-instar females are present. These latter two life stages overwinter. Adult males, as well as pupal instars are unknown but second instar males are common.

Key words: Coccidae, *Lecanopsis pellizzariae* n. sp., morphology, life history.

INTRODUCTION

During our field research in May 1999, along the Italian peninsula, we visited the Sirino Mountain, an interesting site of southern Italy in the Basilicata region. This mountain is 2005 m high and are from the Thyrrenic coast. We visited, in particular, some localities along the road that goes up the Sirino Mountain, to the villages of Lagonegro and Lauria. These localities are at about 1300-1500 m, and are not far from a glacial lake, Lago Laudemio. The predominant habitats are characterised by wet meadows and beech-tree forest. In these localities we collected several samples of coccids, and in particular two species of *Lecanopsis* Targioni Tozzetti, 1968, *Lecanopsis clodiensis* (Pellizzari, 1995) and *Lecanopsis* n. sp., and a third species, resembling another *Lecanopsis* species in its external appearance.

The *Lecanopsis* specimens were collected under stones or on basal parts of Gramineae. They were adult females without any trophic relation to a host plant, as is usual in this genus. On the other hand, the third species found under stones was feeding actively on the stolons of Gramineae (Fig. 1). Several specimens were collected with their host plants in order to rear them in the laboratory.

The same localities were visited again the following June and September, in order to investigate the natural history of the species. Consequently, we obtained various immature instars of the females and 2nd-instar males in the laboratory and field. Several adult females of this unusual new species were collected in Val Fondillo (Abruzzo region) in 2000. Based on its morphological characters and peculiar biology, the species is different from other known soft scales and is described as new to science.



Fig. 1 - *Lecanopsis pellizzariae* n. sp., adult females feeding on Gramineae roots. Monte Sirino, VI.1999, photo P. Fontana.

Lecanopsis pellizzariae n. sp.

Adult female. Living specimens orange in colour, elongate, moderately convex, with short anal cleft.

Adult female specimens of two sizes. Slide-mounted specimens of female collected in May (Fig. 2 A) clearly smaller, 2,01-2,32 (2,13) mm long, and 1,04-1,36 (1,17) mm wide. Females collected in June (Fig. 2 B) larger, 2,9-3,28 (3,08) mm long, 1,94-2,61

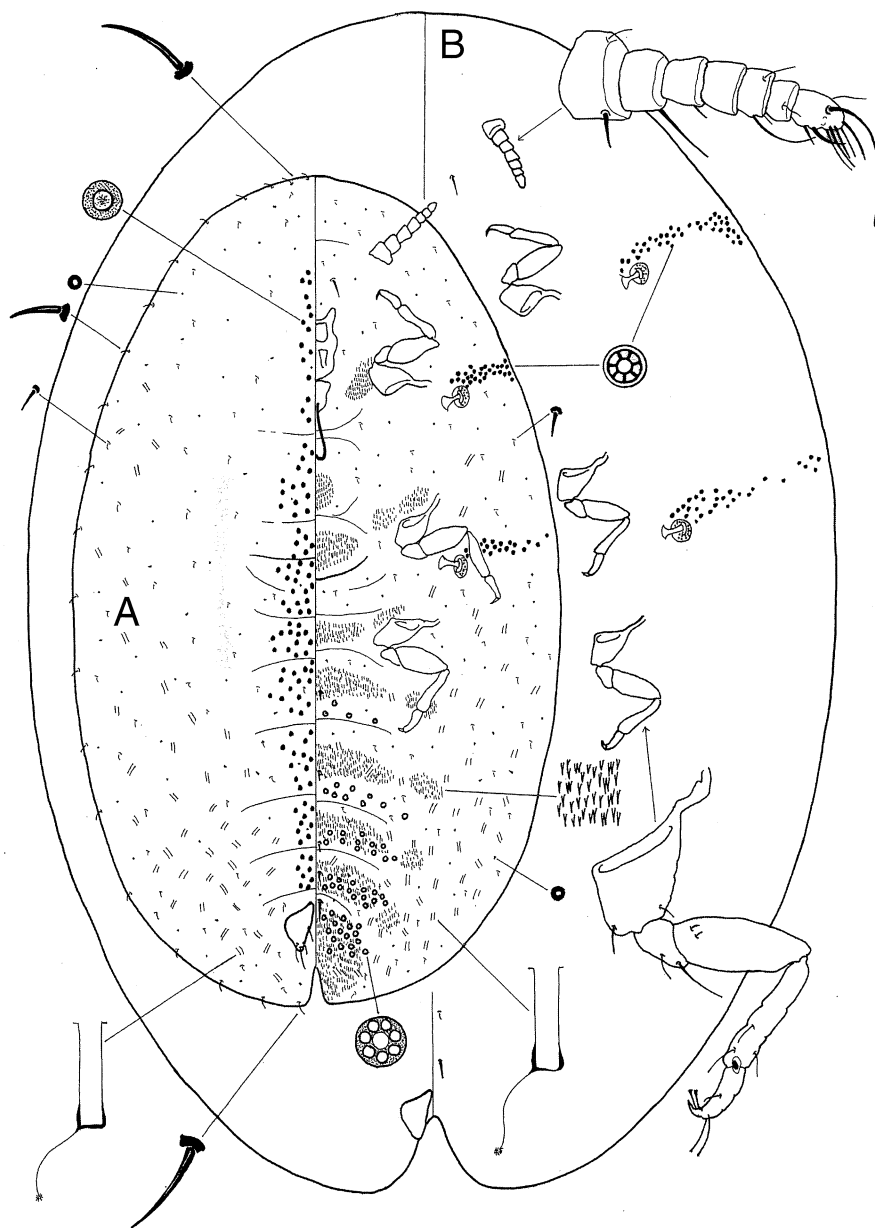


Fig. 2 - *Lecanopsis pellizzariae* n. sp., adult female. A: female collected in May (Holotype). B: female collected in June.

(2,22) mm wide. Difference in size only in body length; legs, antennae and other sclerotized structures more or less constant. Increased size, due to feeding activity of females, see discussion.

VENTER: Derm membranous, with segmentation on thorax and abdomen. Dermal spinules present medially from prothorax (only behind legs) to last abdominal segment. Antennae 7-segmented, slightly conical, 0,230-0,250 (238,5) μm long. Loop of stylets reaching mesosternum. Legs stout, 521,5-566,2 (536,4) μm long, with weakly curved tarsus, claw conical, without denticle. Spiracles, opening in a sclerotized peritreme cavity. Spiracles with 6-23 (13,6) multilocular disc-pores in each peritreme cavity; peritreme disc-pore with a diameter of 3,7-4 (3,8) μm . Spiracular pores with 4-8 (usually 6) loculi and diameter of 3,7-7 (5,16) μm , form elongate group between each spiracle and body margin, with 33-58 (39,4) disc-pores near each anterior spiracle, and 14-37 (22,5) disc-pores near each posterior spiracle. Pregenital disc-pores with 6-8 (usually 7) loculi and diameter of 5,6-7,4 (7,2) μm , present near genital opening and on last 5 abdominal segments. Small simple pores with sclerotized rim numerous and scattered all over venter. Tubular ducts of same size, numerous on abdomen (abundant and dense on anal lobes), present also on thorax; tubular ducts 17,39-18,5 (18,00) μm long with diameter of 3,7-4,07 (3,94) μm . Marginal setae hair-like, short. Setae on margin of anal lobes slightly longer than other marginal setae. Minute spine-like setae numerous, scattered. One pair of interantennal setae and one pair of pregenital setae.

DORSUM: Derm membranous, with segmentation on thorax and abdomen. Anal plates subtriangular with widely rounded angles. Preopercular pores of different sizes with diameter of 5,5-7,4 (6,4) μm , forming a narrow longitudinal band extending from head to anal region. Small simple pores scattered. Tubular ducts of same size and shape of venter, present in lower number. Minute hair-like setae scattered.

First instar (Fig. 3)

Living specimen yellowish-orange, elongate and flattened, with legs and antennae well developed. Slide-mounted specimens 0,447-0,536 (0,508) mm long and 0,194-0,223 (0,211) mm wide.

VENTER: Derm membranous with segmentation on thorax and abdomen. Dermal spinules absent. Antennae 6-segmented, 89-119 (104,5) μm long. One pair of interantennal setae. Loop of stylets 149-179 (163) μm long, reaching 2nd abdominal segment. Legs subequal, stout, with tibia and tarsus not articulated. Tarsal digituli clearly longer than claws digituli. Spiracles with 1-2 multilocular disc-pores in each peritreme cavity. Spiracular disc-pores, with 6-8 loculi, forming a group located between each spiracle and body margin; first group with 2-4 (2,78) disc pores, second with 2-4 (2,78) disc-pores. Diameter of spiracular disc-pores 3,70-4,44 (4,07) μm . Minute ventral setae forming submarginal row around body and two submedial longitudinal rows on abdomen.

DORSUM: Derm membranous, with weak signs of segmentation on thorax and abdomen. Anal ring with 6 setae. Anal plates absent. Dorsal setae minute, a pair each on the head and thoracic segments.

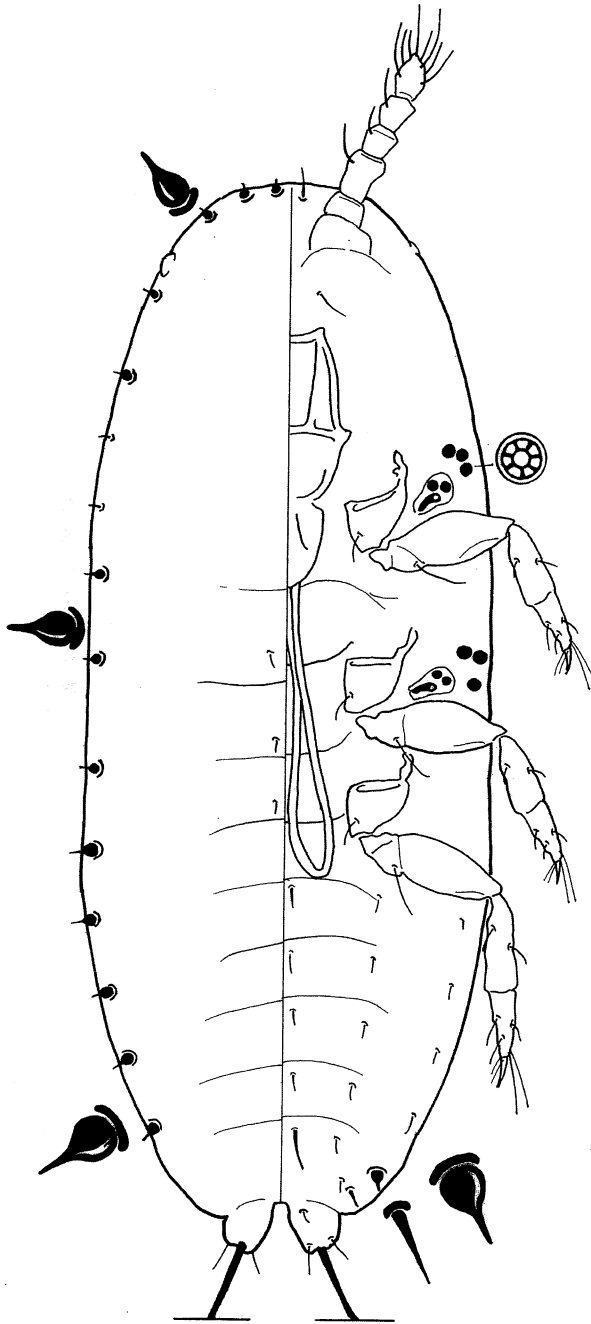


Fig. 3 - *Lecanopsis pellizzariae* n. sp., crawler (Paratype).

MARGIN: Anal lobes well developed with apical seta 148-189 (167) μm long. Marginal setae minaret-like, present on margin of dorsum, except for last pair that is on margin of venter, as discussed by Pellizzari & Fontana (in press). There are (on either side) 4 minaret-like setae on head, 3 on thorax plus 2 non-minaret-like setae and 7 on abdomen. Last marginal seta, before anal lobe, non-minaret-like.

Second instar female (Fig. 4)

Living specimens orange, moderately convex, entirely enclosed in glassy wax test. Slide-mounted specimens elongate elliptical, 0,924-1,103 (1,01) mm long and 0,402-0,596 (0,507) mm wide.

VENTER: Derm membranous, with segmentation on thorax and abdomen. Dermal spinules present. Antennae very short, conical, 6-segmented, 50-60 (55) μm long. One pair of interantennal setae. Loop of stylets reaching mesosternum. Legs sub-conical, short and stout, with tibia and tarsus partially fused, 74,5-104,3 (91,2) μm long. Claw sub-conical, short. Tarsal digituli short, same length as claw. Spiracles with 10-18 (13,8) disc-pores in peritreme cavity; diameter of peritreme disc-pores is 3,7-4,1 (3,9) μm . Spiracular disc pores with 5-8 loculi, forming two subtriangular groups behind spiracles and extending between them to body margin; first group with 15-41 (22,2) disc pores, second group with 14-23 (18,5) disc-pores. Two groups connected by weak row of pore forming indefinite marginal band with 1-3 (1,5) disc-pores. Diameter of spiracular disc-pores 9,4-100,2 (9,75) μm . Ventral setae small and short, scattered. Small simple pores scattered over venter. Median setae, on five posterior abdominal sternites.

DORSUM: Derm membranous, with weak signs of segmentation. Anal plates well developed, subtriangular. Anal ring with 6 setae. Small simple pores scattered all over the dorsum.

MARGIN: Marginal setae conical and stout on anal lobes, short, hair-like on head, thorax and abdomen.

Third instar female (Fig. 5)

Living specimens orange oval, moderately convex and entirely enclosed in glassy wax test. Slide-mounted specimens 1,132-1,52 (1,29) mm long and 0,45-0,83 (0,64) mm wide.

VENTER: Derm membranous, with segmentation on thorax and abdomen. Dermal spinules present medially from prothorax (behind legs) to last abdominal segment. Antennae long, weakly conical, 7-segmented, 1,26-1,56 (1,4) mm long. One pair of interantennal setae. Loop of stylets reaching the end of mesosternum. Legs stout, elongate, with all segments well developed 3,05-3,35 (3,14) mm long (coxa + trochanter-femur + tibia + tarsus + claw). Claw subconical, short. Digituli longer than claw. Spiracles with peritreme cavity covered by disc-pores, set very close to each other. Spiracular disc pores with 4-9 loculi, forming two elliptical elongate groups, anterior of spiracles and extending to body margin. Anterior group with 7-37 (17,1)

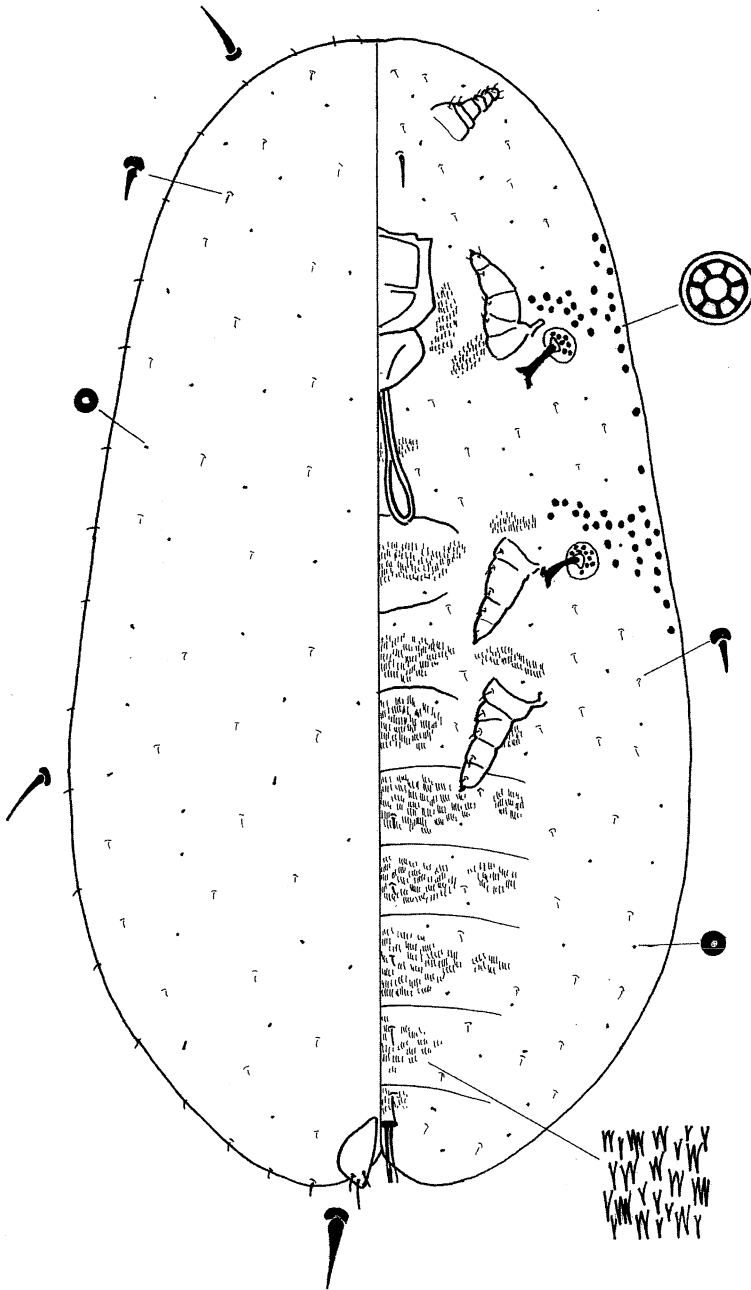


Fig. 4 - *Lecanopsis pellizzariae* n. sp., 2nd-instar female (Paratype).

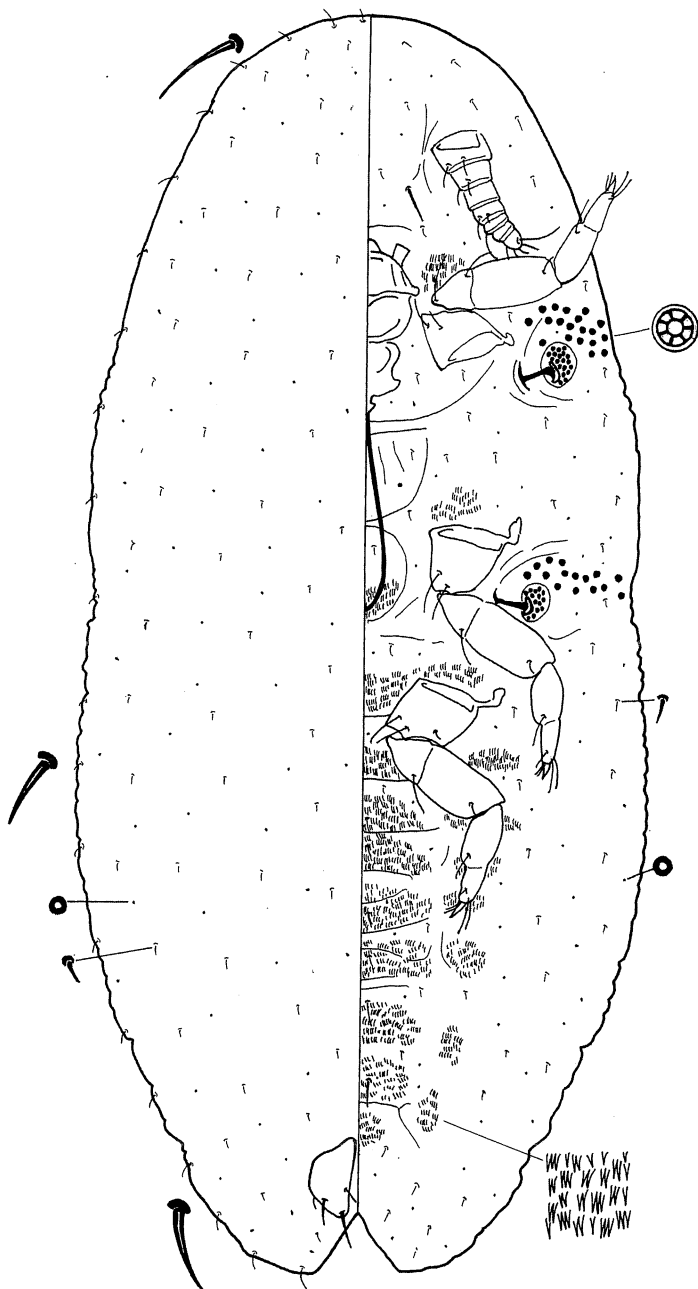


Fig. 5 - *Lecanopsis pellizzariae* n. sp., 3rd-instar female (Paratype).

disc pores, posterior group with 5-17 (12) pores. Ventral setae small, scattered. Median setae, on five posterior abdominal sternites. Small simple pores scattered.

DORSUM: Derm membranous, with weak signs of segmentation. Anal plates well developed, subtriangular. Anal ring with 6 setae. Dorsal setae small, scattered. Small simple pores scattered.

MARGIN: Marginal setae hair-like, longer on head and on anal lobes.

Second instar male (Fig. 6)

Living specimens orange, elongate, flattened and entirely enclosed in glassy wax test. Legs and antennae well developed.

Slide-mounted specimens 1,043-1,22 (1,16) mm long and 0,48-0,596 (0,53) mm wide.

VENTER: Derm membranous, with segmentation on thorax and abdomen. Dermal spinules present. Antennae 7-segmented, 120-130 (123) μ m long and well developed. One pair of interantennal setae. Loop of mouth stylets reaching the end of mesosternum. Legs well developed, long. Claw long, subconical. Tarsal digituli longer than claw digituli. Spiracles with peritreme cavity covered by disc-pores. Spiracular disc pores with 5-9 loculi, forming group of 13-28 (21,5) disc-pores near anterior spiracle, and group of 2-9 (6) disc-pores near posterior spiracle. Small simple pores scattered. Large, median setae, on five posterior abdominal sternites.

DORSUM: Anal plates well developed, subtriangular. Small simple pores scattered. Dorsal setae small, scattered. Tubular ducts present in medially interrupted row across fourth abdominal segment, with 9-14 (11,5) ducts on each side.

MARGIN: Marginal setae subequal along body margin.

Examined material

Type material: Holotype adult female: ITALY, Basilicata region, Lagonegro (Potenza) Monte Sirino, loc. Niella, 1200 m, 12.V.1999, 1 adult female, slide N. 885/1 leg. Malagnini V. and Fontana P.

Paratype: same locality and date of holotype, 41 adult females, slides N. 885/2-29, 898/1-11 and 900/1-2, leg. Malagnini V. and Fontana P.; same locality, 22.VI.1999, 7 adult females, slides N. 898/12-18, leg. Malagnini V. and Fontana P.; same locality, 23.VI.1999, 11 adult females, slides N. 898/12-18 and 899/1-4, leg. Malagnini V. and Fontana P.; 38 crawlers obtained after rearing of material collected in the same locality (12.V.1999), slides N. 885/8/1-16, 885/28/1-18 and 885/29/1-3 leg. Malagnini V. and Fontana P.; 5 2nd-instar females, obtained after rearing of material collected in the same locality (12.V.1999), slides N. 930/1-5 leg. Malagnini V. and Fontana P.; 52 3rd-instar females, obtained after rearing of material collected in the same locality (12.V.1999), slides N. 930/6-58 leg. Malagnini V. and Fontana P.; 28 2nd-instar males, obtained after rearing of material collected in the same locality (12.V.1999), slides N. 930/58-86 leg. Malagnini V. and Fontana P.; same locality, 29.IX.1999, 1 2nd-instar male, slide N. 932/1 leg. Fontana P. and Buzzetti F. M.; same locality, 29.IX.1999, 7

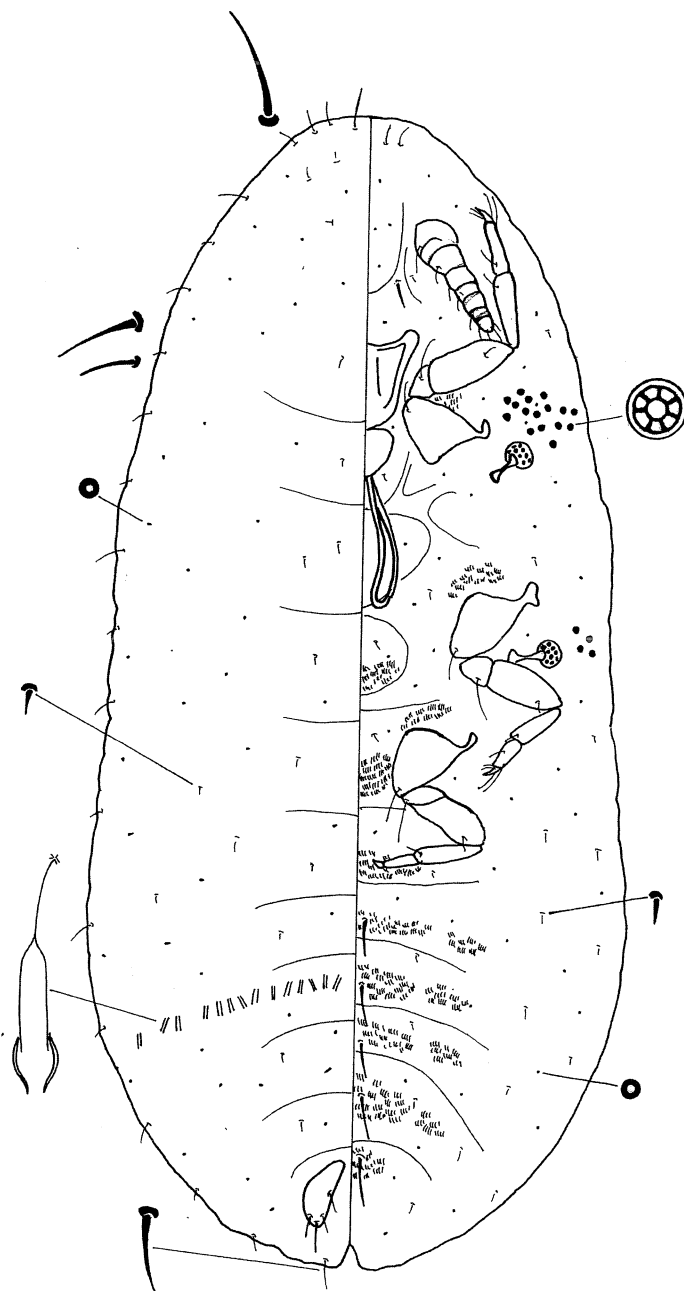


Fig. 6 - *Lecanopsis pellizzariae* n. sp., 2nd-instar male (Paratype).

3rd -instar females, slides N. 929/1-6 and 932/2 leg. Fontana P. and Buzzetti F. M. (Paratypes: 59 adult females, 38 crawlers, 5 2nd -instar females, 29 2nd -instar male and 59 3rd -instar females).

Other material: Italy, Abruzzo region, Pescasseroli (l'Aquila), Val Fondillo, 1200 m, 7 females, slides N. 965/1-7 leg. Fontana P. and Malagnini V..

All the specimens are preserved in the collection of the Dipartimento di Agronomia Ambientale e Produzioni Vegetali - Entomologia, Università di Padova.

Name derivation

The species is named after our teacher and advisor, Professor Giuseppina Pellizzari.

First remarks on the life history of *Lecanopsis pellizzariae* n. sp.

Based on our field and laboratory records, the life history of *Lecanopsis pellizzariae* is similar to that of the species of *Lecanopsis*, as presented by Boratynski *et al.* (1982) for *Lecanopsis formicarum* and by Pellizzari & Fontana (2001) for *Lecanopsis clodiensis*. The overwintering stages are the 3rd-instar females and the 2nd-instar males. In early spring females mature and have a different feeding pattern from *Lecanopsis* species whose biology is known: they feed on subterranean stolons of their host plants. Other species do not feed as adults. As a result of this feeding activity, the females attain a remarkably large size, and while still feeding, they start their reproductive activity. Males other than 2nd-instars have not been observed. Adult females with loose eggsacs have been observed in the laboratory in May and in the field in June (Fig. 7). Crawlers hatch after about one month and actively disperse. Second instar females are present until September but after this time only 3rd-instar females and 2nd-instar males are present. There is no obvious size increase in body size during the 3rd life stage, as observed in *L. clodiensis* and *L. formicarum* Newstead, 1893, species by Pellizzari & Fontana (2001).

The localities in the Apennine mountains where *L. pellizzariae* n. sp. was found are characterised as wet and cold meadows, with typical mountain vegetation. During the winter snow is usually present for long periods.

COMMENTS

The taxonomy of the genus *Lecanopsis* has been studied by Pellizzari & Fontana (in press). This research included a detailed analysis of morphological characters of all life stages of *Lecanopsis* species. These Authors characterised species of the genus *Lecanopsis* as having females with preopercular pores that form a longitudinal band on the dorsum and spiracular multilocular disc pores predominantly with more than five loculi on the venter; 1st-instars with minaret-like marginal setae; 2nd and 3rd-instar



Fig. 7. - *Lecanopsis pellizzariae* n. sp., adult females with eggsacs; Monte Sirino, VI.1999, photo P. Fontana.

females with reduced legs and antennae conical, also by the waxy test that encloses them. *Lecanopsis pellizzariae* n. sp. is characterised by the non-minaret-like shape of the last marginal seta of the 1st-instar, the presence of well-developed legs in the 3rd-instar females and also, in comparison with *Lecanopsis* species whose biology is known, the unusual increase in body size of the adult female, because of their feeding activity. In spite of this peculiar pattern of morphological and biological characters, it was at present appropriate to assign the new species to the genus *Lecanopsis*.

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