

Morphological observations on the chinese wax scale (*Ceroplastes sinensis* DEL GUERCIO).

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OBSERVATIONS MORPHOLOGIQUES SUR LA COCHENILLE
CHINOISE (*CEROPLASTES SINENSIS* DEL GUERCIO)

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RESUME - Diverses espèces de *Ceroplastes* représentant des ravageurs économiques potentiels des *Citrus*, l'étude morphologique des différentes espèces a été entreprise.

La présente note donne des caractéristiques morphologiques de l'espèce *Ceroplastes sinensis* à partir de l'étude d'individus de diverses provenances.

Several species of *Ceroplastes* spp. infest *Citrus* and are considered to be serious economic pests for large quantities of honeydew which often cover the leaves and stems of host tree, and act as a medium for black sootymolds giving an unsightly appearance to the plant.

In the last three years a study on *Ceroplastes* species infesting *Citrus* spp., *Ficus* spp., *Nerium oleander*, ornamental and spontaneous plants was carried out to investigate the species and their morphological characters in Italy.

In this note morphological details for the Chinese wax scale *Ceroplastes sinensis* DEL GUERCIO are reported.

HOSTS AND COLLECTING LOCALITIES

Following the order of the table 1 the collecting localities for the Campania region on *Citrus* spp. were : 1) Sorrento, 2) S. Agnello, 3) Castellammare, 4) Quisisana, 5) S. Antonio Abbate, 6) Vico Equense, 9) Torre Annunziata ;

the specimens on *Cytisus scoparius* were collected in Castellammare (10). The material from Sicily was collected on *Citrus* spp. in the Catania area (7), that from Liguria on *Citrus* spp. in the La Spezia area (8).

MATERIAL AND METHODS

Specimens preserved dry were first placed in a watch glass half filled with clove oil to remove the thick wax covering the dorsal area of the body. After 24 - 48 hours, specimens were transferred in acetic acid (glacial) for 10 - 15 minutes and successively in distilled water for the same time.

For clearing specimens they were transferred in 10 % KOH solution and heated for two or three times until boiling and became transparent.

Cleared specimens were then transferred in distilled water for 10 - 15 minutes and successively in staining solution for 12 - 24 hours. Stained specimens were transferred in a washing solution until excess stain was removed, and

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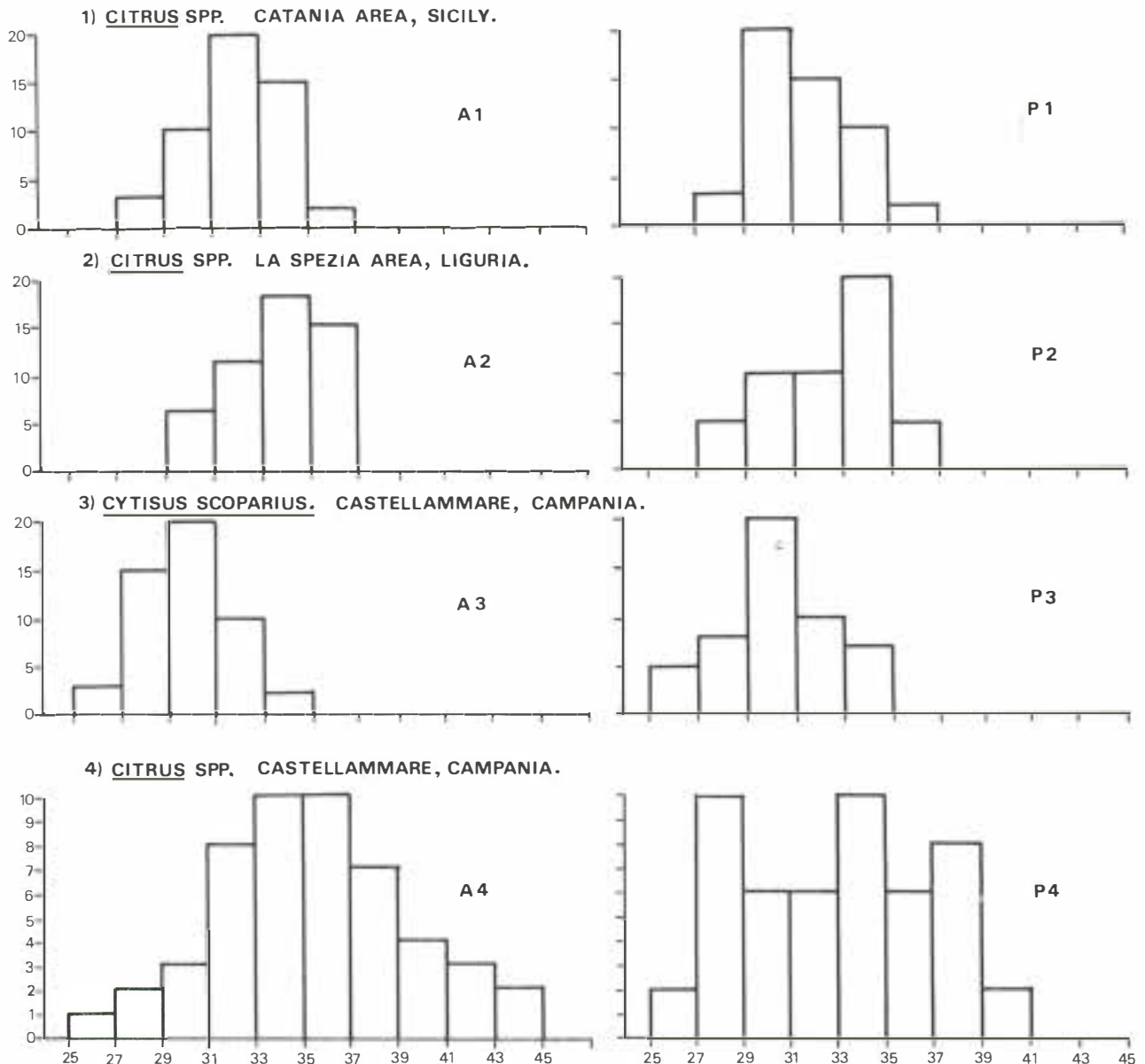


FIGURE 1 * HISTOGRAMS ARRANGED WITH 50 DATA ON STIGMATIC SETAE (A = ANTERIOR, P = POSTERIOR) BY MEANS TI 59 ELECTRONIC CALCULATOR PROGRAM 07 FOR THE HOSTS ABOVE AND COLLECTING LOCALITIES. (Numbers of individuals against numbers of setae).

successively in acetic acid for 10 - 15 minutes. The specimens were then transferred to clove oil for 10 minutes or longer and successively on a glass-slides in EMEXEL R.I. 1-495, a synthetic mountant. The square cover glass was mounted on four small strips of glass to avoid the squeezing of specimens.

Freshly collected material was kept in a fixative solution before treatment as the dry material.

Slides were kept in drying oven at room temperature for 24 hours before labelling.

The following characters were considered on 50 specimens for each locality.

Antennae. Total length and number of segments.

Legs. Length of trochanter + femur and tibiae + tarsus of one of the posterior leg.

Marginal setae. The number of setae in the anterior region of the body between spiracular furrows, the number of setae between the anterior and posterior spiracular furrow on left and right side and the marginal setae on the posterior

TABLE 1.

No	antennae		leg			marginal setae				length of marginal setae
	segments	length	trochanter femur	tibiae tarsus	anterior	intraspiracular		posterior		
						right	left	right	left	
1	7	265 13	160 15	185 12	10,8 1,7	3 1	3,2 1	10,4 1,8	9,9 1,4	23 2
2	7	293 15	167 7	189 8	10,8 1,7	2 0	2,5 0,5	10,5 1	9,3 0,5	27 0
3	7	299 2	176 13	199 6	13 2,5	4 0	3,4 0,5	11,8 1,3	12,4 1,6	21 0
4	7	258 8	156 4	180 7	9,5 1,1	3,2 0,9	2,7 0,9	11,2 1,7	11 0,8	22 5
5	7	266 3	156 11	180 9	10,6 1,6	3,4 0,8	3 1	9,8 1,9	10 2,1	24 3
6	7	282 13	158 6	177 9	8 0	2,6 0,6	2 0	9 0	9 0	23 3
7	7	286 14	165 4	187 14	9 1,4	3,2 0,9	3,2 0,2	11 1,7	10 1,4	22 4
8	7	291 10	163 4	185 6	9,2 1,8	2,8 1	3 0,8	9,8 1,4	9,8 1,4	25 2
9	7	210 22	134 4	158 1	10,6 5	2 1,4	2,3 1	8,3 2,6	8,6 0,5	19 2
10	7	284 1	149 1	177 1	9,7 0,9	3 0	3 0	8,5 3,5	12 0	21 0

No	stigmatic		setae		length of stigmatic setae		anal plates		anal process			spiracular pores	
	anterior right	anterior left	posterior right	posterior left	smaller	longer	right	left	longitud.	transver.	anterior	posterior	
													1
2	34,0 3,3	35,7 4,1	34,5 9,3	33,5 4,7	10 0	21 4	134 3	135 0	573 6	777 20	66 5	69 4,7	
3	26,6 4,5	26,0 4,6	28,4 4,6	25,6 4,3	10 0	16 0	110 19	110 12	334 79	391 11	54 5	58 8	
4	35,7 7,6	32,3 2,7	31,0 3,9	31,0 1,2	10 0	24 5	123 8	126 9	288 7	329 17	55 6	56 4,5	
5	31,8 5,3	34,8 4	27,4 4,2	29,4 1,6	10 0	24 3	129 7	127 7	294 6	334 6	61 5	62 5,9	
6	34,6 3,7	37 1,7	31,6 5,7	31,6 3	10 0	23 3	130 30	130 13	684 3	909 13	71 1	72 3,5	
7	30,8 3,1	32,4 3,5	33,4 4,6	33,2 4,3	9 2	22 4	123 7	123 7	403 9	507 13	56 7	61 9	
8	33,6 2,3	32,5 2,9	30,8 2,8	30,8 3	9 2	22 3	129 6	129 6	441 1	526 5	62 6	63 7,3	
9	28,6 3,5	28,6 2,0	27,6 3,5	29,3 4,7	9 3	23 3	122 1	122 1	284 4	353 5	52 3	53 3	
10	33,5 3,6	33 8,2	31,2 6,9	30 3,5	5 0	21 0	134 4	137 4	600 4	783 2	51 4	47 6	

region between the posterior furrow and the anal lobe for each side. For some (10) of these setae a length was measured and mean calculated.

Stigmatic setae. The number and the length of the longer and smaller.

Anal plates. The length of the right and left.

Anal process. The longitudinal and transversal length.

Quinquelocular pores along the stigmatic area was counted.

Means and standard deviations were calculated with the 50 data of each character and histograms were arranged for the stigmatic setae for four collecting areas (Liguria, Sicily, Campania on *Citrus* spp., and *Cytisus scoparius*).

DISCUSSION

In table 1 are reported means and standard deviations for the considered characters and for the 10 collecting localities and hosts. All measurements are in microns.

As we can see, the antennae were found 7 segmented and the total length ranged from 210 to 299 microns. The length of leg segments ranged as follows: trochanter + femur from 149 to 167 and tibia + tarsus from 158 to 199 microns. The marginal setae were placed as follows around the body: from 8 to 11 in the anterior side between each anterior stigmatic furrow, from 2 to 4 between each anterior and posterior stigmatic furrow, and from 8 to 12 between each posterior stigmatic furrow and the anal cleft. The length of the stigmatic setae ranged from 19 to 27 microns.

The number of setae in the four stigmatic furrows ranged from 26 to 36, the length of the smaller was 9 microns and for the longer ranged from 21 to 24 microns.

The anal plates length ranged from 110 to 137 microns. The longitudinal length of the anal process ranged from 284 to 684 microns and the transversal from 827 to 909 microns.

The number of spiracular pores ranged for the anterior and the posterior sides from 47 to 72.

The histograms IA and IP were arranged with data on

stigmatic setae emerged from material collected on *Citrus* spp. in Sicily (Catania). The number of setae ranged from 27 to 37 with highest frequency between 31 to 33 for the anterior furrow and between 29 to 31 for the posterior ones.

The histograms 2A and 2P were arranged as the precedents with data of material collected on *Citrus* spp. in Liguria (La Spezia). The number of setae ranged from 27 to 37 as the material from Sicily, but the highest frequency was from 33 to 35 for anterior and posterior furrows.

With data emerged on material collected on *Cytisus scoparius* in Campania, histograms 3A and 3P were arranged. Number of setae ranged between 25 to 35 and the highest frequency between 29 to 31. Data very heterogeneous emerged from material collected on *Citrus* spp. in Campania (Castellammare). They are reported in the histograms 4A and 4P. The number of setae ranged from 25 to 45 and the highest frequency for the anterior furrow was between 33 to 37 and for the posterior furrow between 27 to 29 and also between 33 to 35. Histograms are reported in figure 1.

CONCLUSION

The material of *Ceroplastes sinensis* DEL GUERCIO examined showed characters in accordance with the study carried out by GIMPEL, MILLER and DAVIDSON (1974) on the wax scale in the United States. The range of variations observed on the Italian material for most of characters falls within limits reported by the authors mentioned.

As to number of stigmatic setae some differences appear. Besides samples with a mean of 34 stigmatic setae reported as typical for this species, we can find samples with means of 26 or 27, data also observed as the minimum for some samples.

The range of variations in the number of these setae in 9 samples was also near to 10 (from 25 to 35). The authors above cited report from 18 to 43 setae. These variations were observed only in the sample collected in Castellammare area.

A study to show if the observed variations are constant in time and related to other interesting morphological characters not considered so far will be carried out in the future.

BIBLIOGRAPHY

- GIMPEL (W.F.), MILLER (D.R.) and DAVIDSON (J.A.). 1974.
A systematic revision of the wax scales genus *Ceroplastes* in the United States (*Homoptera* : *Coccoidea* : *Coccidae*).
Agr. Exp. Sta. Univ. of Maryland Misc. Publ. n° 841, 85 pp.