

COMPARATIVE SCANNING ELECTRON MICROSCOPE STUDIES ON *PHOLEOIXODES RUGICOLLIS* (SCHULZE ET SCHLOTTKE, 1929) (IXODIDAE)

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Abstract. The morphology of the surface structure of the sclerotized cuticle of *Pholeoixodes rugicollis* is revealed by SEM observation. Micrographs of larvae and nymphs of *Ph. rugicollis*, *Ph. hexagonus* and *Ph. canisuga* can lead to a rapid identification of these three species.

The study of *Pholeoixodes rugicollis* (Schulze et Schlottke, 1929) by scanning electron microscopy confirms the reality of this species with reference to related ones: *Ph. hexagonus* (Leach, 1815) and *Ph. canisuga* (Johnston, 1849). Only micrographs of larva and nymph are published here since adults can be easily diagnosed (Morel and Aubert 1975, Aubert 1977).

MATERIAL AND METHOD

All specimens were collected from wild carnivores in the north-eastern part of France. The ticks were killed in alcohol and dried in a Bomar S. P. C. 900 Ex dryer, then treated with goldpalladium. Many specimens of the same stage were observed in order to confirm the constancy of external structure for each species.

RESULTS

LARVAE

We point out two dorsal structures of the capitulum that lead to a rapid identification:

1. Lateral edges of the basis capituli

Ph. rugicollis (Plate I, Figs. 3, 4): Lateral edges parallel drawing two right angles with the posterior edge.

Ph. hexagonus (Plate I, Fig. 2): Lateral edges not parallel; each one draws with the posterior edge an acute angle very slightly extended into a postero-lateral cornua.

Ph. canisuga (Plate I, Fig. 1): Lateral edges in the line of the anterior margins of the basis capituli. The postero-lateral angles are very acute, they evoke laterally extended cornua.

2. Palps

Ph. rugicollis (Plate I, Figs. 3, 4): Palps very broad, bat-shaped, covering the hypostome and the cheliceral sheaths. This odd characteristic is common with larvae, nymphs and adults of this species.

Ph. hexagonus (Plate I, Fig. 2): Palps not bat-shaped, a little more massive than the palps of *Ph. canisuga* (Plate I, Fig. 1).

A last specific characteristic of *Ph. rugicollis* is the ornamentation of the sclerotized cuticle: angular scales can be seen on the capitulum (Plate I, Figs. 3, 4), scutum (Plate I, Fig. 4) and legs (Plate I, Fig. 5). This ornamentation explains the granular and saccharoid aspect of the sclerotized cuticle that we described after optical microscope observation (Aubert 1977).

NYMPHS

Dorsal observation of the capitulum can lead to a rapid identification.

Ph. rugicollis (Plate II, Fig. 7): Lateral edges of the basis parallel, drawing with the straight posterior edge two right angles.

Ph. hexagonus: This species differs from the other two in that its two basidorsal cornua are posteriorly extended.

Ph. canisuga (Plate II, Fig. 6): On account of the regular aspect of its capitulum, this species can be confused with *Ph. rugicollis*. But in this species we can observe broad palps with tortuous grooves (Plate II, Figs. 7, 11), the ornamentation of the sclerotized cuticle is characteristic (Plate II, Figs. 7, 9, 11).

Hypostome represents also an important morphological feature: It is rib-shaped in *Ph. rugicollis* (Plate II, Fig. 11) and isodiametric and top-rounded in *Ph. hexagonus* (Plate II, Fig. 12). On account of large denticles in its upper part, the hypostome looks like a club and its apex is flattened in *Ph. canisuga* (Plate II, Fig. 10). These characteristics are common with larvae, nymphs and females of the three species.

These keys based on twelve micrographs and clear body marks afford a rapid identification test between the three species even with a simple binocular microscope. For a more accurate study the essential bibliography is given.

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ИЗУЧЕНИЕ *PHOLEOIXODES RUGICOLLIS* (SCHULZE ET SCHLOTTKE, 1929) (IXODIDAE) ПОД СКАНИРУЮЩИМ ЭЛЕКТРОННЫМ МИКРОСКОПОМ

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Резюме. Морфологию поверхностных структур склеротизированной кутикулы *Pholeoixodes rugicollis* изучали при помощи сканирующего электронного микроскопа. Микрофотографии личинок и нимф *Ph. rugicollis*, *Ph. hexagonus* и *Ph. canisuga* позволяют быструю идентификацию этих трех видов.

REFERENCES

- AUBERT M. F., Description du mâle de *Pholeoixodes rugicollis* (Schulze et Schlottke, 1929) (Acariens, Ixodina). Ann. Parasitol. Hum. Comp. 52: 481—490, 1977.
- MOREL P. C., AUBERT M. F. A., Contribution à la connaissance de *Pholeoixodes rugicollis* (Schulze et Schlottke, 1929) (Acariens, Ixodina). Cah. O. R. S. T. O. M., sér. Entomol. Med. Parasitol. 13: 99—109, 1975.
- , PEREZ C., Morphologie des stades préimaginaux des Ixodinae s. str. d'Europe Occidentale. II. Les larves des *Pholeoixodes* Schulze, 1942. Cah. O. R. S. T. O. M., sér. Entomol. Med. Parasitol. 11: 275—284, 1973.
- , —, Morphologie des stades préimaginaux des Ixodidae s. str. d'Europe Occidentale. III. Les nymphes des *Pholeoixodes* Schulze, 1942. Cah. O. R. S. T. O. M., sér. Entomol. Med. Parasitol. 11: 285—291, 1973.
- SCHULZE P., SCHLOTTKE E., Kleinhöhlenbewohnende deutsche Zecken mit Beschreibung dreier neuer Bauhöhlenbrüter und einer Bestimmungstabelle der deutschen Ixodes. Sitz. Ber. Abhandl. Naturf. Ges. Rostock 2: 95—110, 1929.

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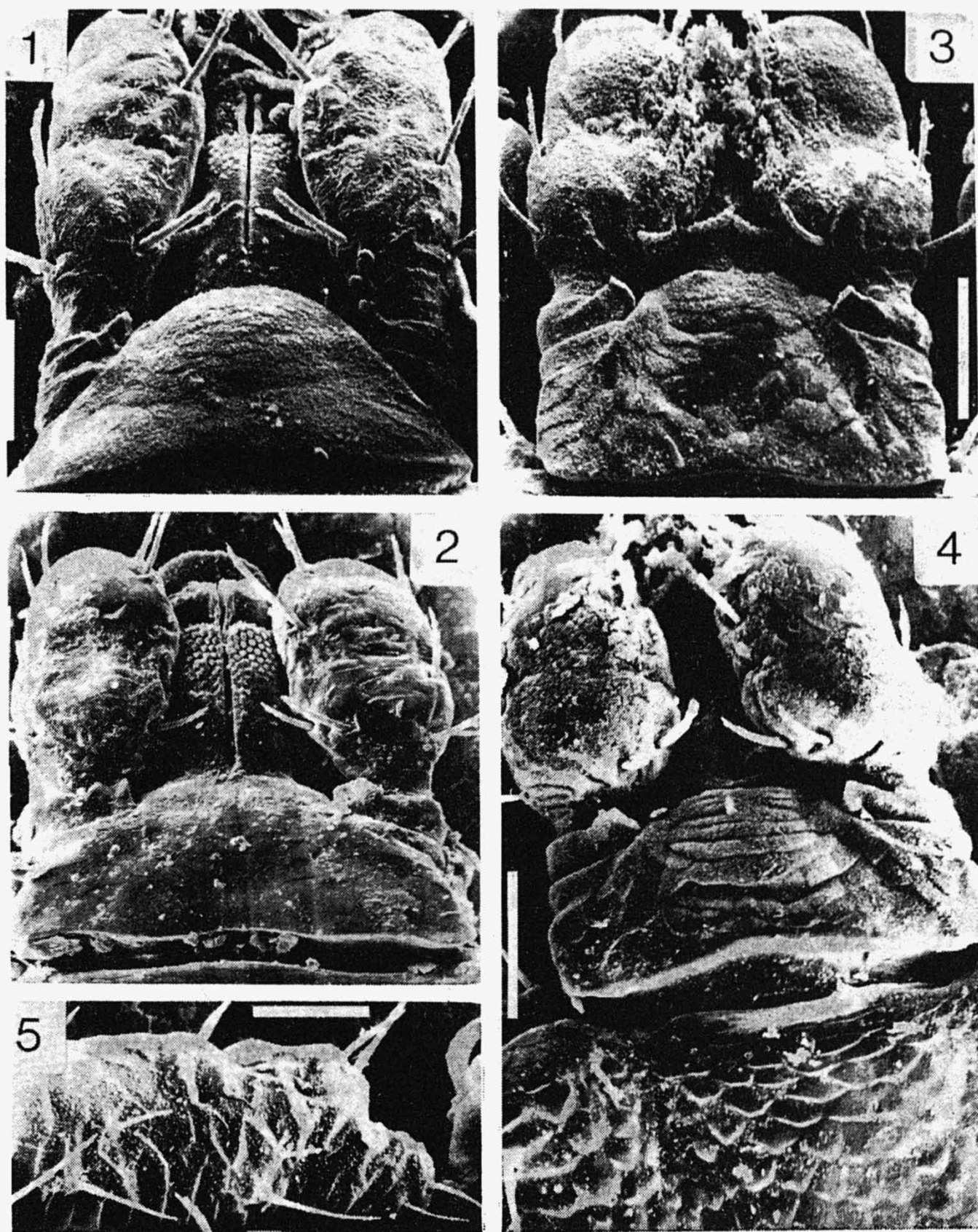


Fig. 1—3. Dorsal view of larval capitulum. Fig. 1. *Pholeoixodes canisuga*. Fig. 2. *Ph. hexagonus*. Fig. 3. *Ph. rugicollis*. Fig. 4. *Ph. rugicollis*, larva (other specimen). Dorsal view of the capitulum and a part of scutum. Fig. 5. *Ph. rugicollis*, larva. Tarsus I and Haller's organ. The white line represents 0.05 mm.

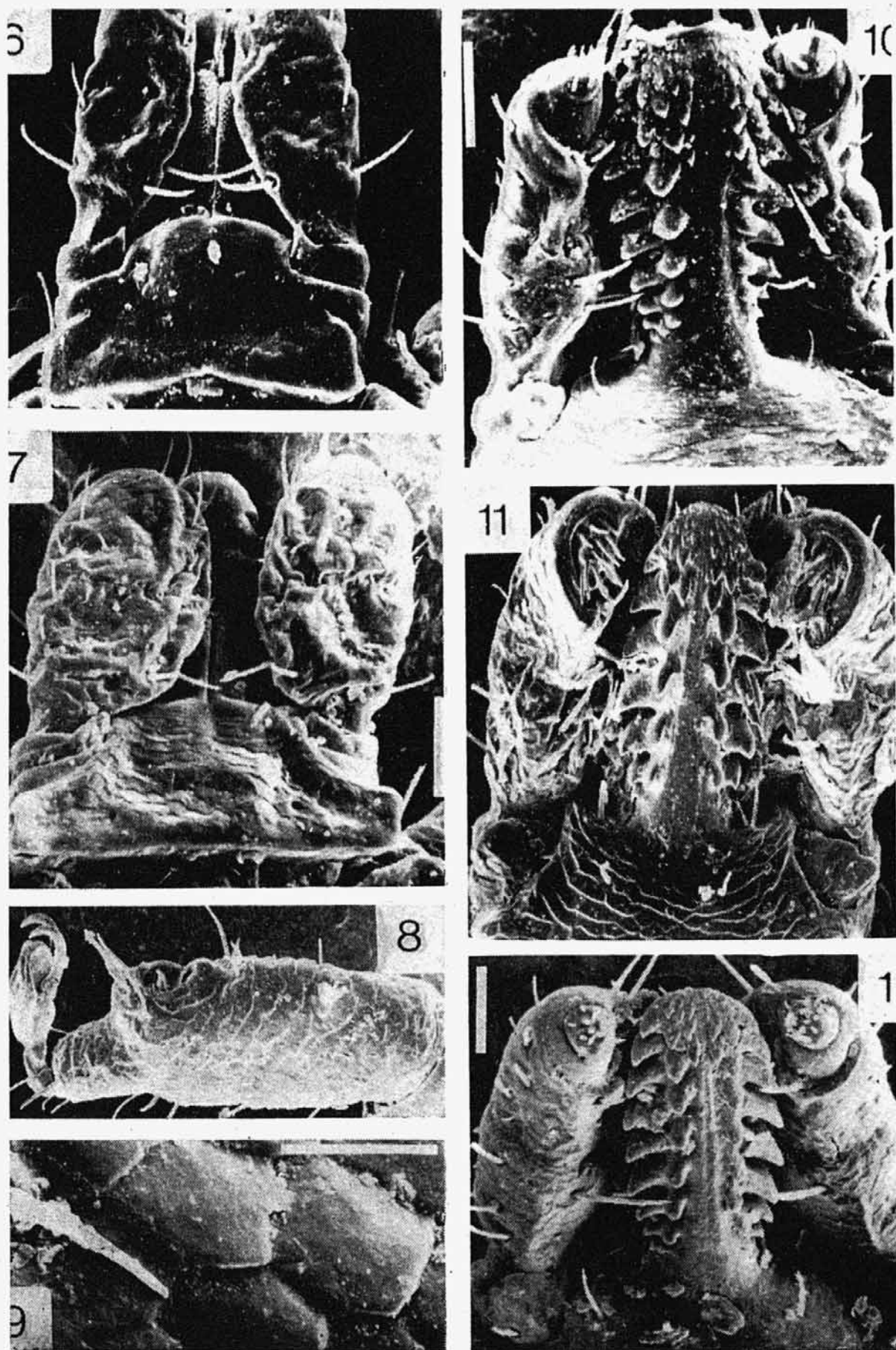


Fig. 6. *Ph. canisuga* nymph Dorsal view of the capitulum. Fig. 7. *Ph. rugicollis*, nymph. Dorsal view of the capitulum. Fig. 8. *Ph. rugicollis*, nymph. Tarsus I and Haller's organ. Fig. 9. *Ph. rugicollis* nymph. Detail of the scutum. Fig. 10—12. Ventral view of nymphal capitulum. Fig. 10. *Ph. canisuga*. Fig. 11. *Ph. rugicollis*. Fig. 12. *Ph. hexagonus*. The white line represents 0.05 mm.