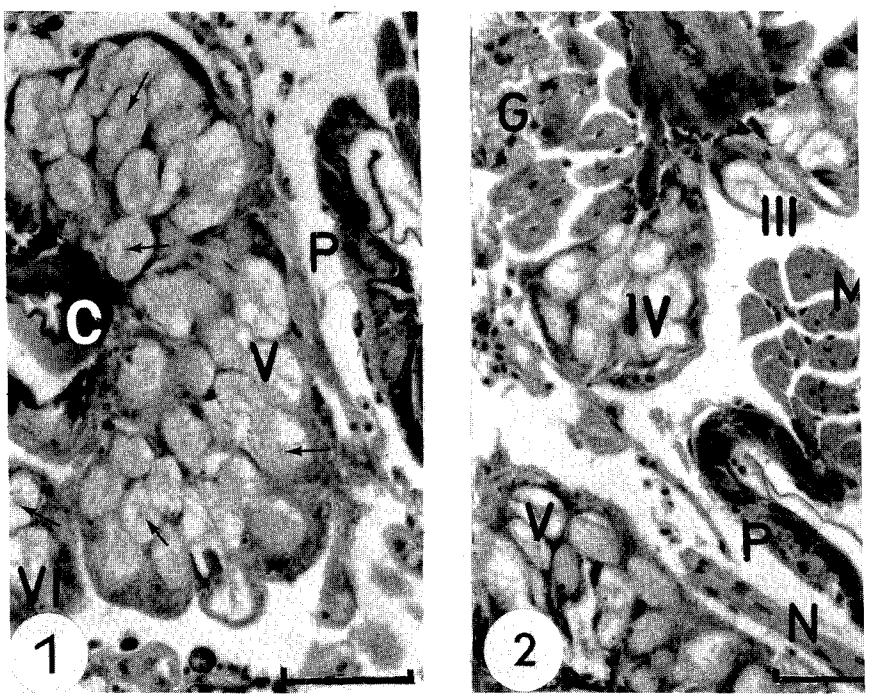
COXAL GLANDS OF THE GENUS *METEPEIRA* (ARANEAE, ARANEIDAE)

As pointed out by Levi (Levi, H. W. 1977, Bull. Mus. Comp. Zool. Harvard, 148:185-238), the spiders of the american genus *Metepeira* are easily distinguished from other Araneidae by their light eye region, white median line on sternum, relative length of the leg segments, small male palpus, weakly sclerotized epigynum and the special composite web. However, there is a feature of internal anatomy that is distinctive, among Araneidae, to the genus *Metepeira*: the presence of conspicuous coxal glands.

I first discovered these organs on the occasion of a histological survey of specimens of *Metepeira incrassata* F. P.-Cambridge, a species from el Estado de Veracruz, Mexico (Lopez, A. 1978, C. R. Acad. Sc. Paris, 286: 407-409). In confirming the results of these previous histological investigations, I have recently observed them in specimens of three other species collected in the United States: *Metepeira labyrinthea* (Hentz) from Kentucky, *M. arizonica* Chamberlin and Ivie and *M. gosoga* Chamberlin and Ivie, from Arizona.

Each organ, when slightly magnified, appears as a cluster of vesicles with a sinuous endotheliform wall and fibrous contents. This honeycomb formation, bathed in hemolymph, lies against the cuticle and the hypodermal epithelium (Figs. 1, 2). In fact, the vesicles are large, curved basophilic cells having eccentric rounded nuclei; they enclose



Figs. 1, 2.–*Metepeira incrassata*, horizontal sections of the cephalic region. 1, Female. Coxal glands: pair V and a part of pair VI, the labyrinth of which is not visible; 2, Male. Pairs III, IV and V of coxal glands. Abbreviations: C = cuticle; G = gnathocoxal glands; M = muscles; N = palpal nerve; P = pharyngeal organ. Arrows = ductuli. Scale lines = 60 μm.

extracellular cavities, 50 μm large on an average, containing fibrils which are probably nothing more than microvilli and, possibly, a secretion. A short ductulus originates in each cavity center (Fig. 1); it pierces the nearby integument which, apparently, is almost reduced to endocuticle and here forms a pitlike recess.

The organs in both sexes show an even, symmetrical distribution that horizontal sections clearly bring to light (Fig. 2). The last pair of glands (VI) is located behind the coxae of the first walking legs. Each of them is associated with a small dorsal labyrinth, 300 μm long, which shows the well-known basal striation in its acidophilic epithelium. The five other pairs are visible in a more anterior position that can be termed cephalic. Two of the pairs (pairs V and IV) occupy the bases of gnathocoxae: the external pair (V) is separated from the "pharyngeal organ" by the pedipalpal nerve, whereas the internal pair (IV) lies in front of the lateral fold of the pharynx, close to the maxillary glands (Fig. 2). Pair III is smaller, laterally located in the base of the rostrum, and lies adjacent and medially to pair IV (Fig. 2). Pair III is smaller, laterally located in the base of the rostrum, and lies adjacent and medially to pair IV (Fig. 2). Pair II is less conspicuous than the previous organs and lies beneath the cuticle of the rostro-cheliceral groove, exactly on a level with the paturon base. The forward pair (I) is extremely reduced and nestles under the integument of the ocular projection.

I regard all these organs as modified coxal glands, one "thoracic" (VI) and five others "cephalic", owing to their segmental arrangement, outlet locations, basic sacculus-like pattern and, chiefly, the close connection of pair VI with a recognizable, small, labyrinth. They are of major interest because they confirm and express precisely the fundamental prosomatic segmentation, as was explained in a prior publication (Lopez, A. 1978, op. cit.). Moreover, it appears that the genus *Metepeira* is exceptional among the Araneidae, in which coxal glands generally are poorly developed, being almost reduced to the sacculus and corresponding to Buxton's third and highest evolutionary stage in *Araneae verae* (Buxton, B. H. 1913, Zool. Jahrb., 14:231-282). The coxal glands of *Metepeira* are a peculiarity of the genus and not an evolutionary vestige. We will know more when further studies have been made into other genera of Araneidae and also into related families.

It is noteworthy that the coxal glands look histologically somewhat like the so-called "pharyngeal taste organ" (Millot, J. 1936, Bull. Soc. Zool. France, 61:27-38). mentioned above. This structure can no longer be regarded sensory but must be recognized as an exocrine gland opening into the pharyngeal cavity (personal observations in Oecobiidae and Hersiliidae). Its similarity to the cephalic coxal glands, especially in the genus *Metepeira*, and the results of parallel studies in *Uroctea* lead me to believe that they are perhaps all homologous.

There might be two hypotheses as to the actual role of coxal glands in the physiology of *Metepeira*, though neither is entirely convincing: 1) a filtering excretory function; 2) the secretion of a pheromone, if we consider the recently discovered opisthosomatic organs (Kovoor, J., Lopez, A. and Emerit, M. 1981. Proc. 6eme Coll. Arachnol. express. franç. Modena Pisa, Sept., 1981:53-60), the basic histological structures of which appear to be fairly closely related to those described here as coxal glands.

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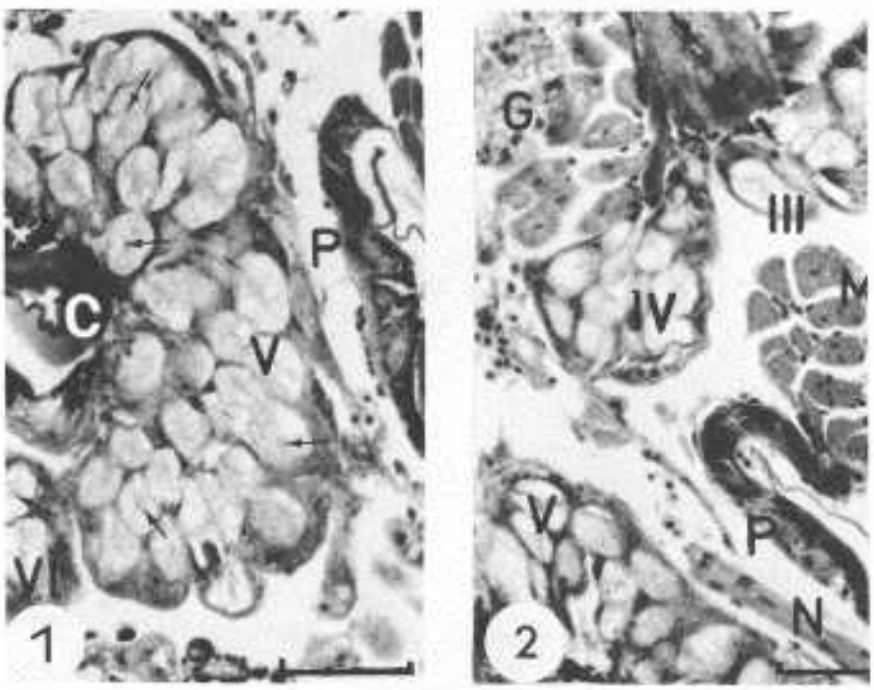

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