# CLARIFICATION OF THE MATING PROCEDURE OF *PEUCETIA VIRIDANS* (ARANEIDA: OXYOPIDAE) BY A MICROSCOPIC EXAMINATION OF THE EPIGYNAL PLUG [1, 2]

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In a study of the mating behavior of *Peucetia viridans* (Hentz), Whitcomb and Eason (1965) stated that the right palpus appeared to inseminate the left side of the epigynum, and the left palpus the right side. As their observations were inconclusive, and since the philosophical implications of such a possibility are important, we have investigated morphological evidence from which we conclude that the right palpus is used for the right side and vice versa.

The male and female meet venter to venter, facing in the same direction (Whitcomb and Eason 1965), so that the left palpus is in line with the right side of the epigynum. No crossing over of the palpi was observed. Copulation is so rapid in this species and the palpi are alternated so quickly, however, that Whitcomb and Eason could not be certain that the palpi did not cross over. Observations of former workers, summarized by Gertsch (1949, p. 93), indicate that in all more advanced spiders the right palpus is applied to the right female orifice, and the left palpus to the left orifice.

In *Peucetia viridans*, the paracymbium of the male palpus has a function in copulation that is quite unusual among spiders.[5] The distal half of the paracymbium is two-pronged, the longer ventral process curving downward and forward from the outer side of the straight dorsal prong (Fig. 1). During copulation, the dorsal prong, probably acting as a guide, is inserted through the opening into the external tube of the female epigynum along with the embolus (which contains the seminal duct). The ventral prong fits over the outside of the epigynum, and the hook at its tip is received by a depression on the outer anterior part of the epigynum. This locks the paracymbium in place and limits the distance it can be inserted. The paracymbium is often broken off just proximal to its branching when the male withdraws the embolus.

The epigynum probably is always covered with a "resinous" material after copulation, its origin yet unknown. Not all mated females exhibit this covering, which is easily removed and probably is sometimes lost during egg-laying. However, the epigyna of most mated females have

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[5] No other record of such a function is known to us. Most spiders of the Lycosoidea lack a paracymbium, including *Oxyopes*. None of the spiders which commonly do possess such a sclerite, mostly encountered in the Epeiroidea, are known to use it as a guide for the embolus, and in most cases its shape precludes such a possibility. Closely related species of *Peucetia*, however, may be expected to use the paracymbium as does *P. viridans*, although nothing is known of their mating habits.

the resinous covering intact if the specimens have not been "cleaned" by former handling. It plugs the openings and tubes which lead to the seminal receptacles and covers the entire epigynal plate. Embedded in it are often the distal parts of one or both male paracymbia, with the dorsal prong within the female tube, the ventral prong hooked over the outside (Fig. 2).

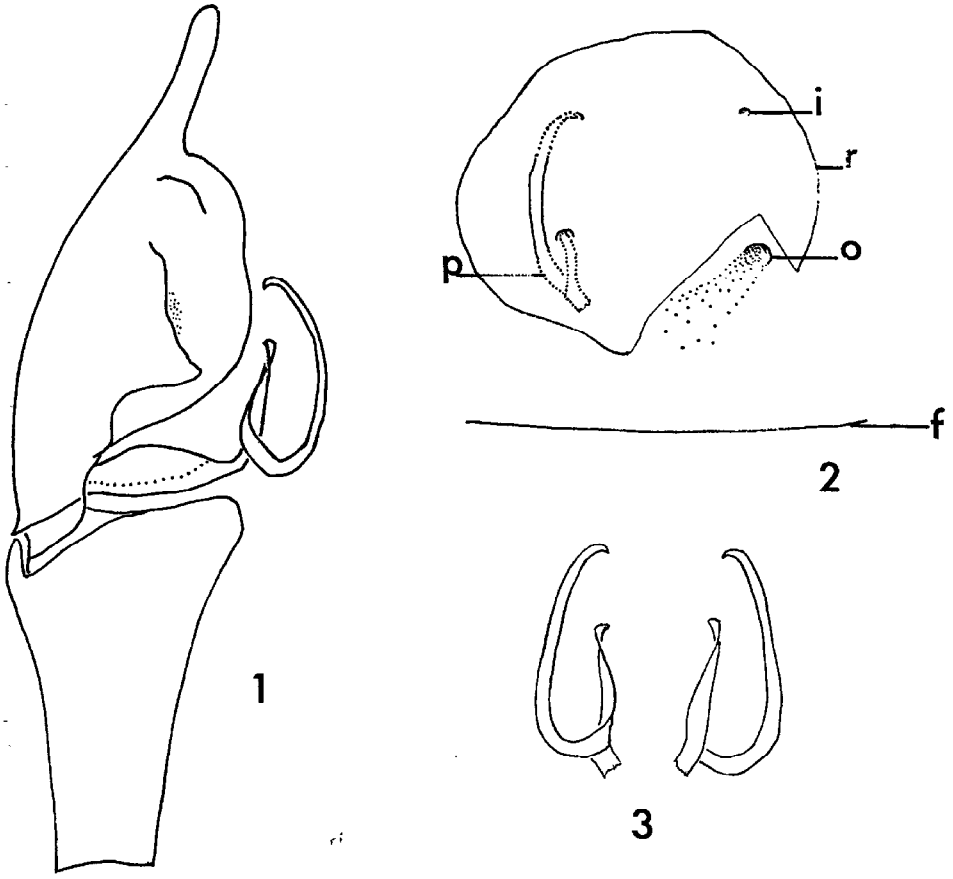


Fig. 1-3. *Peucetia viridans.* Fig. 1. Right male palpus, dorsolateral view, showing cymbium and paracymbium (parts of the bulb not included). Fig. 2. Epigynum of mated female, plugged with "resinous" material and part of a right paracymbium of a male. Left paracymbium has been removed. (p, terminal part of male paracymbium, dotted part seen through resinous covering, solid part uncovered; i, indentation in resinous covering made by hook of removed paracymbium; r, resinous covering, cut away below; o, atriobursal opening into epigynum; f, edge of genital fold.) Fig. 3. Left and right sides of left paracymbium, removed from epigynum shown in Fig. 2. The long prong is ventral, the short prong is dorsal.

If the distal part of a paracymbium embedded in the resinous material of the epigynum is removed and cleaned, it can be identified as right or left, because the outer face differs from the inner face (Fig. 3).

Paracymbia were removed from the epigyna of 10 mated females. Twice as many epigna were examined, but in about half the specimens the resinous plug was missing or contained neither paracymbium. The

plug was removed from the left side of the epigynum in all nine females having a paracymbium embedded in that side. In all cases, the paracymbium was part of the left palpus. In one specimen, only the right side of the epigynum contained the male structure, a portion of a right palpus. We conclude, therefore, that the right palpus must cross over in mating to inseminate the right side of the epigynum, the left one the left side, as is true of other "higher" spiders.

LITERATURE CITED

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*Whitcomb, W. H.*, and *R. Eason.* 1965. The mating behavior of *Peucetia viridans* (Araneida: Oxyopidae). Florida Ent. 48: 163-167.