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Bugs of *Lincus* spp. Vectors of Marchitez and Hartrot (Oil Palm and Coconut Diseases) on *Astrocaryum* spp., Amazonian Native Palms

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The bugs of genus *Lincus* (Hemiptera: Pentatomidae: Discocephalinae) are considered vectors of *Phytomonas* palm diseases: 'marchitez sorpresiva' of the African oil palm, *Elaeis guineensis* Jacq. (Desmier de Chenon et al. 1983, Desmier de Chenon 1984, Perthuis et al. 1985), and hartrot of the coconut tree, *Cocos nucifera* L. (Desmier de Chenon et al. 1983, Louise et al. 1986). The occurrence of *Lincus* in primary forest was suggested (Louise et al. 1986); however, nothing on the natural habitat of the bugs is known.

Lincus spp. have been found on Amazonian native palms: 1) in Peru on *Astrocaryum macrocalyx* Burret (Kahn & Mejia 2057, USM) in the lower Ucayali River basin, on *A. sp. aff. A. macrocalyx* Burret (Kahn & Llosa 2094, USM, NY) in Madre de Dios, and on *A. sp. aff. A. murumuru* Mart. (Kahn 2031, NY) in the upper Huallaga valley; 2) in French Guyana near Cayenne on *A. murumuru* Mart. (de Granville 7222, CAY).

Specimens of *Lincus* were collected and sent to Dr. Rolston who considered them to be undescribed species.

The presence of both imagoes and larvae on the palm trees suggests that the bugs carry out their whole biological cycle there. The frequency and density of bugs were both very high. They were found on 21 (36.8%) of the 57 *Astrocaryum* trees dis-

sected. One to sixty bugs were counted per palm, although the use of an axe to cut down the palms and of a machete to dissect them may have allowed the escape of an unknown number of insects.

The four species of *Astrocaryum* form dense populations in periodically flooded forests. *A. macrocalyx* and *A. sp. aff. A. macrocalyx* are single-stemmed palms with a trunk up to 5 m in height. *A. murumuru* and *A. sp. aff. A. murumuru* are multi-stemmed palms with clusters of 2-6 axes (generally one adult and several juveniles) which develop trunks up to 3-4 m in height. All four species have large leaves, 6-7 m in length. The sheaths of dead leaves persist on the trunk forming a strongly armed muff which shelters ants, termites, larvae of curculionid and scarabeid beetles, spiders, scorpions, and snakes.

Lincus spp. were found inside the sheaths of the intermediate and lowest green leaves of the crown, among the spines on the back of the petiole. The bug is brown-black as are the spines, which makes the insect difficult to detect, except by its odor.

No bugs were found on *A. macrocalyx* near Manaus, Brazil; however, only one palm was cut down and examined. Bugs were sought without success on other species of the genus *Astrocaryum* (*A. chambira* Burret in Peru; *A. aculeatum*

Meyer, *A. horridum* Barb. Rodr., *A. mumbaca* Mart., *A. sociale* Barb. Rodr. in Brazil; *A. paramaca* Mart., and *A. sciophilum* (Miq.) Pulle in French Guyana). Likewise, no bugs were found on palms of other genera examined in Peru (*Elaeis oleifera* (H.B.K.) Cortés, *Jessenia bataua* (Mart.) Burret, *Iriartella stenocarpa* Burret, *Mauritia flexuosa* L.f., *Pholidostachys synanthera* (Burret) H. E. Moore, *Phytelephas microcarpa* Ruiz et Pavon, and *Orbignya polysticha* Burret).

Bugs of the genus *Lincus* seem to be associated with some very closely related species in the section *Ayri* Drude of the genus *Astrocaryum*, all of which are found in seasonally flooded habitats. The relationship of *Lincus* with *Astrocaryum* is now being studied throughout the Amazon basin, and the possible role of *Astrocaryum* spp. as sources of *Phytomonas* is being analyzed.

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