Vibratory Signals of Two Species of Bugs from the Family Coreidae (Heteroptera)

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Abstract—The vibratory signals of two species of Coreidae from Russia, *Coreus marginatus* L. and *Spathocera laticornis* Shill, are investigated; for *Spathocera laticornis* Shill. such signals are described for the first time. Oscilograms and sonograms of the vibratory signals are given. Coreidae are a large and thoroughly studied (in faunistic terms) family of bugs; however, data about the vibratory communication of the representatives is quite fragmentary at the moment. Currently, vibratory signals are described for *Coreus marginatus* L. and *Enoplops scapha* F. (Gogala, 1984). Slovenian colleagues have in hand unpublished data about the signals of *Gonoceros juniperi Herrich-Schaeffer and Leptoglossus occidentalis* Heidemann (Gogala, 2006). In this connection the research on the vibratory communication of Coreidae is of considerable interest.

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MATERIALS AND METHODS

Vibroacoustic signals of two representatives of the family Coreus marginatus L. and Spathocera laticornis Shill. were investigated. The insects were collected in July 2003 on the territory of the Moscow Region in the neighborhood of the village of Sokolova Pustin, Stupino district. Vibratory signals were recorded with a pickup cartridge (piezoelectric pickup) connected to a computer via a coupling amplifier. A twig of the plant from which an insect was collected was attached to a pickup stylus fixed in a rack using a rubber ring, thus slightly the springing stylus of the piezoelectric element was in constant contact with it. Over the course of the experiment, two males, a male and a female, or single individuals of both genders were put on the twig alternately. During the record we maintained a temperature of 25–28°C.

RESULTS

Coreus marginatus L.

Signals of 14 males and six females were studied. Two types of signals were detected in males. Shorter signals are emitted in the presence of other individuals and while being alone; judging by our observations they function as calling signals (Figs. 1–3). Their duration varies within a range of 330–400 ms. Such signals were described in this species for the first time. Longer pulses (1105–1160 s) probably are courtship signals (Figs. 4–6) which come in irregular intervals. Males emit them in the presence of females, after which he attempts to copulate. Analogous signals with similar amplitude-temporal and frequency parameters were described in Gogala's work (Gogala, 1984).

Spathocera laticornis Shill.

Signals of 6 males and 2 females were studied. According to our observations, the detected male and female signals (Figs. 7–8) perform an aggregate function. The signal is formed by repeated pulses each one with a duration of 79.9–100 ms. Both males and females emit it after being put on a new plant, other individuals answer the signal, then insects gather close to each other forming a group where mating takes place. No specific courtship signals were detected in this species nor were any signals of other types. Copulation takes place in a group without any preliminary courtship, furthermore several males can attempt to copulate with one female at the same time simply pushing each other aside. Insects stay in tactile contact all the time without leaving a group.

It is interesting to note that aggregate signals were described neither in other representatives of Coreidae nor in Pentatomidae. Presumably mate recognition in a group in this species happens with the help of pheromone stimuli. Unlike *C. marginatus*, not only males, but also females of *S. laticornis* emit signals, though one can suppose that we just have not discovered aggregate signals of the first species. Also it is necessary to point out the differences in reproductive behavior: in *C. marginatus* a specific courtship signal always came



Fig. 1

before copulation; in *S. laticornis* a specific courtship signal didn't.

Oscillograms (1, 2, 4, 5, 7) and sonograms (3, 6, 8) of vibratory signals of bugs from the family Coreidae: 1–3 are calling signals, 4–6 are courtship signals of *Coreus marginatus* males; 7–8 are aggregate signals of *Spathocera laticornis*. Fragments of signals numerated 2 and 5 are presented in an enlarged view under the aforementioned numbers.

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