https://www.doi.org/10.33910/2686-9519-2026-18-1-143-151
https://www.zoobank.org/References/DE73FDB1-44BB-476E-8C99-54D07662E03F

UDC 595.754

True bugs (Heteroptera) on *Alangium platanifolium* (Siebold et Zucc.) Harms (Alangiaceae) in southern Primorsky Krai, Russia

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Abstract. This paper presents data on true bugs (Heteroptera: Miridae, Scutelleridae, Pentatomidae) feeding on *Alangium platanifolium* (Siebold et Zucc.) Harms (Alangiaceae) in the southern Russian Far East (Primorsky Krai). The material was collected by the authors in 2013 and 2024–2025 at the only *A. platanifolium* locality in Russia (Nadezhdinsky District) and at a field station in Ussuriysk Urban District. Trophic relationships were studied in the field and in stationary cages for short- and long-term rearing of insects. Six species of polyphagous bugs were found on *A. platanifolium*. Of these, *Palomena viridissima*, and *Eurydema dominulus* have broad ranges, while *Neolygus aceris*, *Poecilocoris lewisi*, *Plautia stali*, and *Lelia decempunctata* occur primarily in southeastern Asia and the southern Russian Far East. Development on this plant from early nymphal instars to winged adults was observed for *Eurydema dominulus* and *Plautia stali*.

***Keywords*:** true bugs, Primorsky Krai, distribution, host plants, *Alangium platanifolium*

Полужесткокрылые насекомые (Heteroptera) с *Alangium platanifolium* (Siebold et Zucc.) Harms (Alangiaceae) на юге Приморского края, Россия

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Аннотация. Приведены данные о полужесткокрылых (Heteroptera: Miridae, Scutelleridae, Pentatomidae), питающихся *Alangium platanifolium* (Siebold et Zucc.) Harms (Alangiaceae) на юге российского Дальнего Востока (Приморский край). Материал собран авторами в 2013 и 2024–2025 гг. в единственном в России местопроизрастании *A. platanifolium* (Надеждинский район) и на полевом стационаре Уссурийского городского округа. Трофические связи изучали в полевых условиях и стационарных садках для кратковременного и длительного содержания насекомых. На *A. platanifolium* обнаружено 6 видов клопов — полифагов, из них *Palomena viridissima* и *Eurydema dominulus* имеют широкий ареал, а *Neolygus aceris*, *Poecilocoris lewisi*, *Plautia stali*, *Lelia decempunctata* живут преимущественно в ЮВ Азии и на юге Дальнего Востока России. Развитие на растении от личинок младшего возраста до окрыления имаго выявлено для *Eurydema dominulus* и *Plautia stali*.

Ключевые слова: клопы, Приморский край, распространение, кормовые растения, алангиум платанолистный

Introduction

The genus *Alangium* Lam. (Alangiaceae DC.), comprises 17 species of shrubs or small trees, predominantly tropical, ranging from Africa through China to eastern Australia (Barnes 2004). *Alangium platanifolium* (Siebold et Zucc.) Harms is the only representative of this genus whose range extends into temperate and cold-temperate continental climates. In China, the Korean Peninsula, Japan, and in northeast Asia, it extends far beyond the tropical zone, reaching the southern boundaries of the Manchurian floristic province (Feng et al. 2009; Ohashi et al. 2009; etc.). *Alangium platanifolium* became known to Russian science from the collections made by the renowned botanist V. L. Komarov in 1897 at the border between China and North Korea in the Yalu River basin (Komarov 1950).

This deciduous shrub was first recorded from Russia in 2001, when plants were discovered at the southwestern end of the Sikhote-Alin mountain range in Nadezhdinsky District, Primorsky Krai. This is the only locality in Russia, isolated by 300–400 km from the main range. The species is listed in the Red Data Book of the Russian Federation and on the IUCN Red List as 'vulnerable' (Prokopenko 2024). Data on population increase and successful naturalization of this species in Primorsky Krai have been published (Fedina et al. 2024).

To develop a conservation program for this species in natural populations, as well as for introduction research, and for landscaping practices, it is necessary to study the biological and phytocoenological characteristics of this rare ornamental plant and identify features of its development, reproduction, and damaging factors.

Numerous publications provide information on the toxicity of chemical components of *A. salvifolium* (L.f.) Wang and the potential insecticidal activity of species of the genus *Alangium* against adult and nymphal insects (Lepidoptera: Noctuidae; Diptera: Culicidae) (Pavunraj et al. 2012; Grosh et al. 2016; Selin-Rani et al. 2016; etc.). The insecticidal and nymphicidal properties of organic substances in the leaves of these plants may serve as a defense against phytophagous insects. However, information on potential pests of *A. platanifolium* (such as aphids, spider mites, or scale insects) that threaten this species remains general and scarce, published only in popular online sources (Flat-leaved alangium 2025).

To date, there is evidence of active visitation and pollination of flowers of *A. salvifolium* in India (Reddy, Aruna 1990; Mahendra, Charan 2024; et al.) and *A. platanifolium* in Japan (Kasagi 2019) by hymenopteran species. For Japan, the bumblebee species *Bombus ardens* Smith, 1879 and *B. diversus* Smith, 1869 are reported as pollinators of *A. platanifolium* in the forests of the Daisen region (Kasagi 2019). We previously reported the bug *Poecilocoris lewisi* (Distant, 1883) (Heteroptera, Scutelleridae) as a sucking insect damaging *A. platanifolium* leaves (Kanyukova et al. 2025). Information on other insects associated with *A. platanifolium* was previously unavailable.

This paper presents data on true bug species (Heteroptera: Miridae, Scutelleridae, Pentatomidae) feeding on *A. platanifolium* in the southern Russian Far East.

Material and methods

The studies were conducted from May to October 2013 and in 2024–2025 during field surveys in Nadezhdinsky District of Primorsky Krai (vicinity of Alekseevka village, 43°33′30″ N, 131°59′03″ E) and at a field station in Ussuriysk Urban District (Kaymanovka village, 43°38′29″ N, 132°15′19″ E). Visual observation, manual collection of insects, and photography were carried out. Trophic relationships were studied in the field and in stationary cages for short- and long-term rearing of insects (Fig. 1). During the studies, more than 150 insect specimens (adults and nymphal instars II–V) were collected or recorded. Below is a list of insect species collected and first reported by the authors from *A. platanifolium*.

 https://www.doi.org/10.33910/2686-9519-2026-18-1-143-151

Fig. 1. Cages on *Alangium platanifolium* for studying insects: *A* — long-term (seasonal) rearing cages; *B* — short-term rearing cages. Photo by M. Maslov

Рис. 1. Садки на *Alangium platanifolium* для исследования насекомых: *A* — длительного (сезонного) содержания; *B* — кратковременного содержания (фото М. Маслова)

Results

Annotated checklist of Heteroptera species living on *Alangium platanifolium*

Miridae

Neolygus aceris Kerzhner, 1988
Fig. 2A

Material. Primorsky Krai, Ussuriysky Urban Okrug, Kaymanovka village, household plot: adults, 35 ex., 06–10.07.2013, 23.06–02.07.2025, T. Markova, M. Maslov.

Biology. Polyphagous phytophage. *Neolygus aceris* was previously recorded from Primorsky Krai on *Acer ginnala* (Maxim.) Maxim. (Kerzhner 1988). Instar V nymphs and adults were collected on *Vitis amurensis* Rupr. from late May to late June (Kanyukova et al. 2022). In Primorsky Krai, we observed it on an *A. platanifolium* plant during the flowering stage from late June to mid-July. It feeds on pedicels and flowers: sepals, petals (leaf part), and stamens (reproductive parts).

Distribution. Southern Far East: Primorsky Krai. — Korean Peninsula (Kerzhner, Josifov 1999).

Scutelleridae

Poecilocoris lewisi (Distant, 1883)
Fig. 3A–B

Material. Primorsky Krai, Nadezhdinsky District, vicinity of Alekseevka village: 11 instar V nymphs, 16.09.2024, M. Maslov.

Biology. Polyphagous phytophage. Host plants from more than 30 families are known (Tsai et al. 2011). In the Russian Far East, it has been recorded from *Pinus koraiensis* Siebold & Zucc. (Pinaceae) (Kanyukova 1988). In Primorsky Krai, it has been collected from *Fraxinus mandshurica* Rupr., *Syringa wolfii* C. K. Schneid. (Oleaceae), *Juglans mandshurica* Maxim. (Juglandaceae), and *Acer negundo* L. (Sapindaceae) (Kanyukova et al. 2025). In September 2024, 11 instar V nymphs of *P. lewisi*, collected from *Alangium platanifolium* at the only locality in Russia where this rare endemic plant species occurs (Fedina et al. 2024), were transferred to Kaymanovka village and reared in cages on this

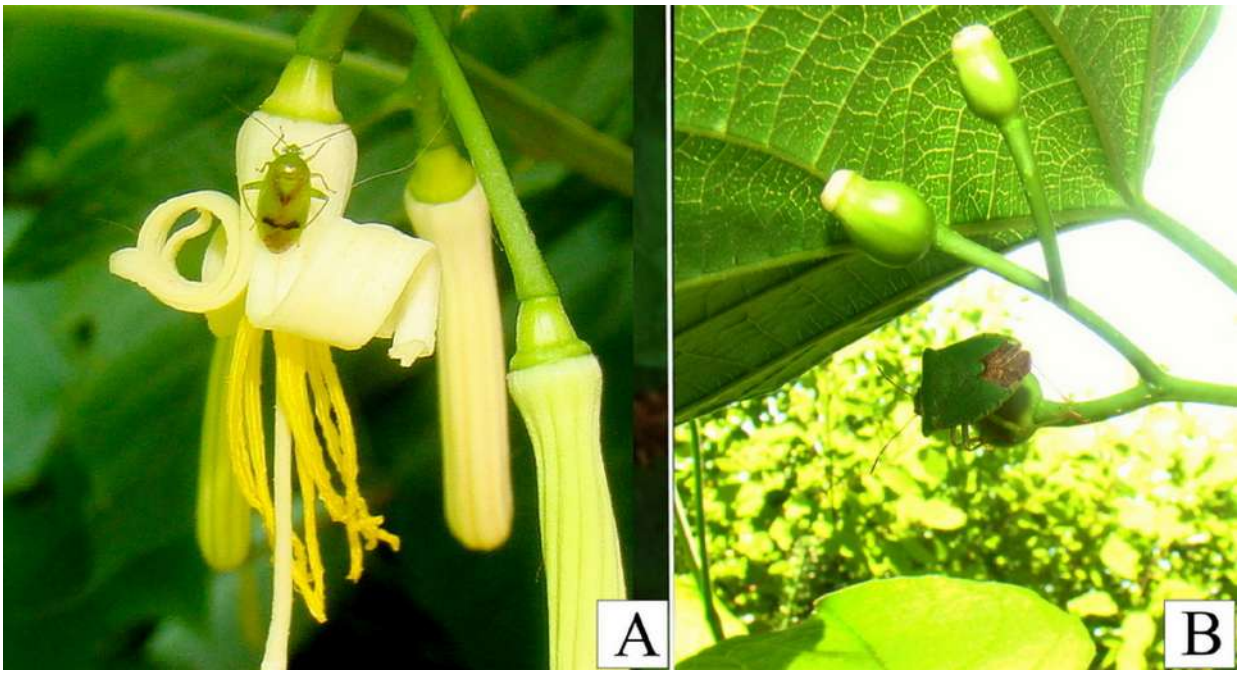

Fig. 2. Adult heteropteran feeding on *Alangium platanifolium*: *A* — *Neolygus aceris* (Miridae) on flower petals, 23.06.2025; *B* — *Palomena viridissima* (Pentatomidae) on a berry, 10.07.2025, Kaymanovka village, field station. Photo by M. Maslov

Рис. 2. Питание имаго Heteroptera на *Alangium platanifolium*: *A* — *Neolygus aceris* (Miridae) на лепестках цветка, 23.06.2025; *B* — *Palomena viridissima* (Pentatomidae) на ягоде, 10.07.2025, с. Кайгановка, стационар (фото М. Маслова)

plant under natural conditions. Feeding of instar V nymphs on *A. platanifolium* leaf blades was confirmed until mid-October and leaf fall (Kanyukova et al. 2025). The nymphs were left in the cages in a state of nymphal diapause for further observation; overwintered specimens continued feeding on unfolding leaf blades until mid-May 2025 (Fig. 3B). It was impossible to rear *P. lewisi* to the adult stage on this plant. Nymphal diapause was also previously noted by Japanese authors (Kobayashi 1954; 1967).

Distribution. Southern Far East: Primorsky Krai. — China, Korean Peninsula, Japan (Kiritshenko 1953; Kobayashi 1954; 1967; Göllner-Scheiding 2006; Tsai et al. 2011; Kanyukova, Ostapenko 2013; Kanyukova et al. 2025).

Pentatomidae

Plautia stali Scott, 1874

Fig. 3C–D

Material. Primorsky Krai, Ussuriysky Urban Okrug, Kaymanovka village, household plot: 20 instar II–V nymphs, 05.07–05.08.2025, T. Markova, M. Maslov.

Winged adults, 15 ex., 11.07–20.08.2025.

Biology. Polyphagous phytophage. Japanese authors provided information on the biology of *Plautia stali*: nymphs feed on fruit of *Chamaecyparis obtusa* (Ziebold & Zucc.) Endl. (Cupressaceae) and *Cryptomeria japonica* (Thunb. ex L.f.) D. Don (Cupressaceae) throughout their development. The species is bivoltine; during dispersal of the second generation from late September to mid-October, adults have been recorded from *Citrus* × *sinensis* (L.) Osbeck (Rutaceae) and *Erythrina corallodendron* L. (Fabaceae). Overwintering adults are found in crowns of evergreen trees and under fallen leaves from late September, and from mid-April they migrate to *C. obtusa* (Tanaka 1979). In the south of the Russian Far East, the species is recorded from broad-leaved trees (Kulik 1965; Kanyukova 1988). In Primorsky Krai, we observed the development of *P. stali* on *Alangium platanifolium* from early July, with adults reaching the winged stage from mid-July to mid-August. Bugs of this species fed on leaves and fruit of *A. platanifolium*, and adults were recorded from this plant until late September.

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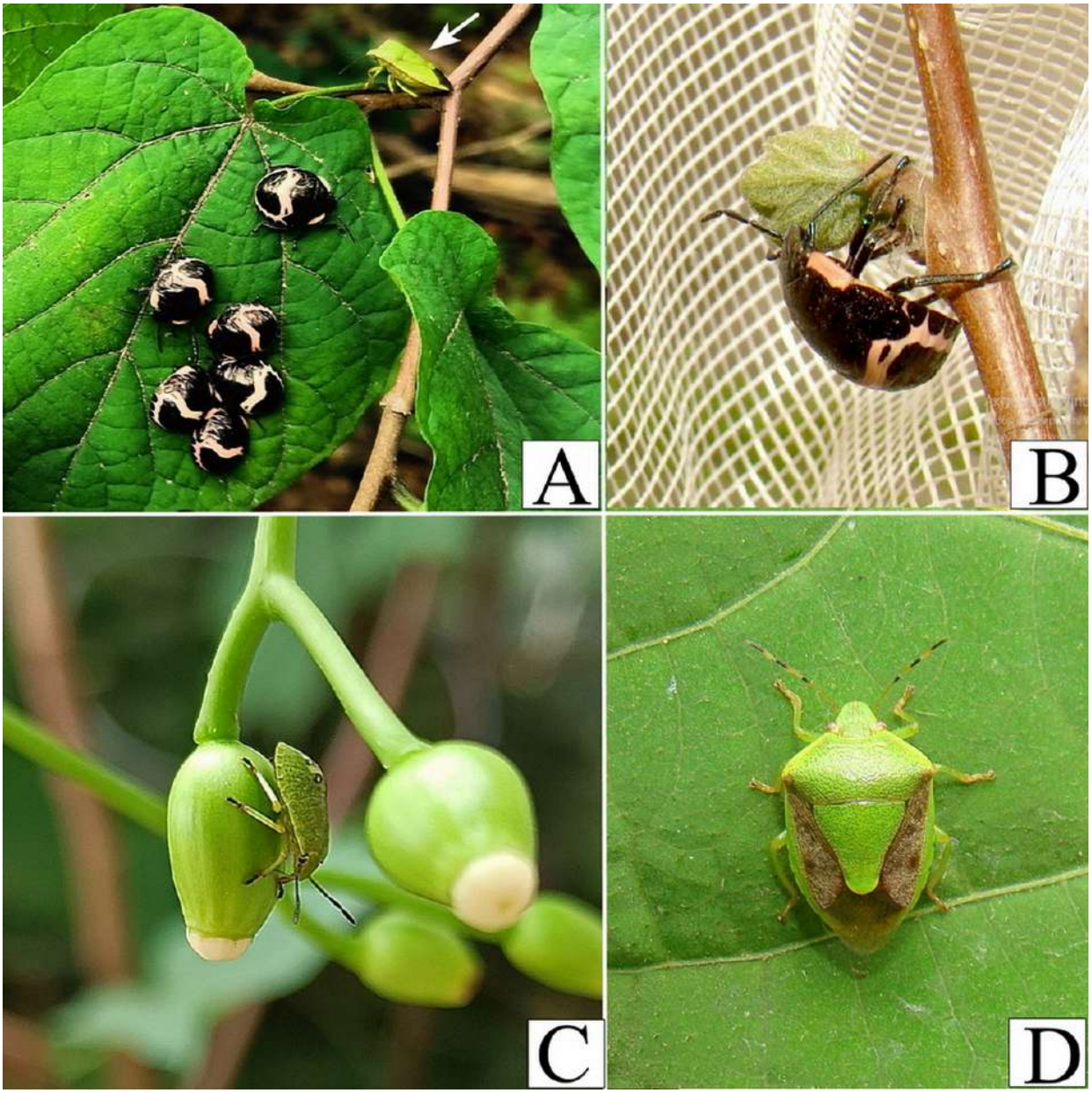

Fig. 3. Feeding of adult and nymphal heteropterans on *Alangium platanifolium*: *A* — *Poecilocoris lewisi* (Scutelleridae), instar V nymphs, and *Palomena viridissima* (Pentatomidae), adult, on a leaf blade (indicated by arrow), 16.09.2024, near Alekseevka village; *B* — *P. lewisi* on an unfolding leaf bud, 08.05.2025, Kaymanovka village, field station; *C* — *Plautia stali* (Pentatomidae), instar IV nymph on a berry, 11.07.2025; *D* — *P. stali*, adult on a leaf blade, reaching the winged adult stage in a cage 18.07.2025, Kaymanovka village, field station. Photo by M. Maslov

Рис. 3. Питание имаго и нимф Heteroptera на *Alangium platanifolium*: *A* — *Poecilocoris lewisi* (Scutelleridae), нимфы V возраста и *Palomena viridissima* (Pentatomidae), имаго, на листовой пластине (обозначен стрелкой), 16.09.2024, окр. с. Алексеевка; *B* — *P. lewisi* на разворачивающейся листовой почке, 08.05.2025, с. Каймановка, стационар; *C* — *Plautia stali* (Pentatomidae), нимфа IV возраста на ягоде, 11.07.2025; *D* — *P. stali*, имаго на листовой пластине, окрыление в садке 18.07.2025, с. Каймановка, стационар (фото М. Маслова)

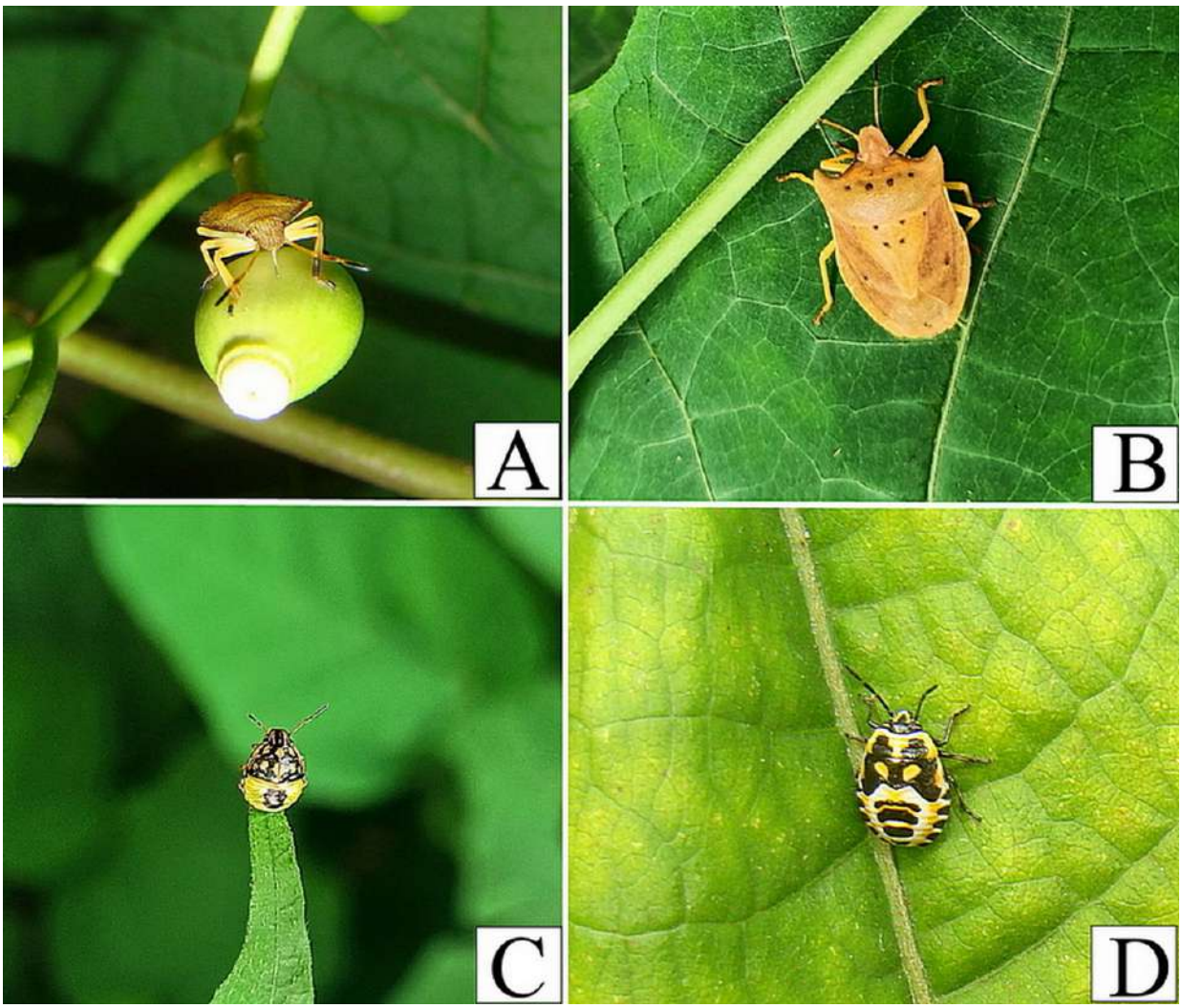

Fig. 4. Adult and nymphal heteropterans feeding on *Alangium platanifolium*: *A — Lelia decempunctata* (Pentatomidae), instar IV nymph on a berry, 23.07.2025; B — *L. decempunctata*, adult on a leaf blade, 16.VII.2025, Kaymanovka village, field station; C — *Eurydema dominulus* (Pentatomidae), instar II nymph on a berry, 11.07.2025; *D — E. dominulus*, instar V nymph on a leaf blade, 11.07.2025, Kaymanovka village, field station. Photo by M. Maslov

Рис. 4. Питание имаго и нимф Heteroptera на *Alangium platanifolium*: *A — Lelia decempunctata* (Pentatomidae), нимфа IV возраста на ягоде, 23.07.2025; *B — L. decempunctata*, имаго на листовой пластине, 16.07.2025, с. Кайгановка, стационар; *C — Eurydema dominulus* (Pentatomidae), нимфа II возраста на ягоде, 11.07.2025; *D — E. dominulus*, нимфа V возраста на листовой пластине, 11.07.2025, с. Кайгановка, стационар (фото М. Маслова)

Distribution. South of the Far East: Amur Oblast (Kanyukova 1992), south of Khabarovsk Krai, Primorsky Krai (Kulik 1965; Kanyukova 1988). — China, Korean Peninsula, Japan, and Hawaii (Tanaka 1979; Vinokurov et al. 2010).

Palomena viridissima (Poda, 1761)

Fig. 2B

Material. Primorsky Krai, Ussuriysky Urban Okrug, Kaymanovka village, household plot: adults, 17 ex., 09–29.07.2025, T. Markova, M. Maslov. Nadezhdinsky District, vicinity of Alekseevka village, imago 4 ex., 16.09.2024, M. Maslov (Fig. 3A).

Biology. Polyphagous phytophage. In Siberia, the species has been recorded primarily from herbaceous plants (Petrova 1975). In Siberia and the southern Far East, it damages plants of the Fabaceae family (Mishchenko 1957; Puchkov 1972; Kanyukova 1995). In Primorsky Krai, adults and instar V nymphs have been

 https://www.doi.org/10.33910/2686-9519-2026-18-1-143-151

recorded feeding on *Ambrosia artemisiifolia* L. (Markova, Maslov 2022). We observed adults sucking cell sap on leaf blades and fruit of *Alangium platanifolium*.

Distribution. Trans-palearctic species.

Lelia decempunctata (Motsch., 1860)
Fig. 4A–B

Material. Primorsky Krai, Ussuriysk Urban Okrug, Kaymanovka village, household plot: adults, 6 ex., 6 instar IV–V nymphs, 11–27.07.2025, T. Markova, M. Maslov.

Biology. Polyphagous phytophage. The species lives on broad-leaved trees in sparse forests. Adults are often found on clover, medick, and other herbaceous plants (Kulik 1965; Kanyukova 1988). In Primorsky Krai, we observed adults and nymphs sucking cell sap from stems, petioles, and leaf blades of *Alangium platanifolium*. Nymphs feeding on berries of this plant were also recorded.

Distribution. Southern Far East: Jewish Autonomous Oblast, southern Khabarovsk Krai, Primorsky Krai (Kanyukova 1988). — China, Korean Peninsula, Japan.

Eurydema dominulus (Scopoli, 1763)
Fig. 4C–D

Material. Primorsky Krai, Ussuriysky Urban Okrug, Kaymanovka village, household plot: adults, 18 ex., 25 instar II–V nymphs, 08.07–30.09.2025, T. Markova, M. Maslov.
Winged adults, 10 ex., 11.07–20.08.2025.

Biology. Polyphagous phytophage. For oviposition, it prefers plants of the Brassicaceae family and is occasionally found on plants of Apiaceae (Petrova 1975). It is known as a pest of cruciferous crops (Mishchenko 1957; Puchkov 1972; Kanyukova 1995). In Primorsky Krai, nymphs and adults have been reported feeding on *Ambrosia artemisiifolia* (Markova, Maslov 2022). We observed *Eurydema dominulus* developing on *Alangium platanifolium* from early July, with adults reaching the winged stage from mid-July to mid-August. Bugs of this species fed on leaf blades and fruit of *Alangium platanifolium*, and adults were found on this plant until late September.

Distribution. Trans-palearctic species.

Conclusions

Six species of polyphagous bugs belonging to three families have been found on *Alangium platanifolium*. Of these, *Palomena viridissima* and *Eurydema dominulus* have broad ranges, while *Neolygus aceris*, *Poecilocoris lewisi*, *Plautia stali*, and *Lelia decempunctata* occur primarily in southeastern Asia and the southern Russian Far East.

During the flowering and fruit-setting stages from late June, adults of *Neolygus aceris* were observed feeding on leaf blades and the reproductive parts of flowers. During the fruiting stage, from mid-July to mid-August, adults of *Palomena viridissima* and adults and nymphs of *Eurydema dominulus*, *Plautia stali*, and *Lelia decempunctata* were found sucking sap from leaf blades and fruits. Nymphs of *Poecilocoris lewisi* fed on *A. platanifolium* leaf blades from mid-September to mid-October, and overwintered individuals continued feeding on unfolding leaf buds until mid-May of the following year. Complete development from early nymphal to winged adult stages on this plant was observed for *Eurydema dominulus* and *Plautia stali*.

Acknowledgments

The authors are grateful to V. B. Kuzmenko, Head of the Interregional Public Organization ‘Tiger Center’; and A. D. Malyk, district forester of the Vladivostok branch of the Primles Regional State Budgetary Institution, for their participation and active assistance in conducting field research. We also sincerely thank E. V. Kanyukova (Zoological Museum, Far Eastern State University) for her advice. Our special thanks are due to E. P. Shvetsov and P. Yu. Khomiakov (Vladivostok) for translating this paper into English.

Funding

This study is part of the state-commissioned assignment of the Ministry of Science and Higher Education of the Russian Federation (topic No. 124012200183-8).

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For citation: Markova, T. O., Maslov, M. V. (2026) True bugs (Heteroptera) on *Alangium platanifolium* (Siebold et Zucc.) Harms (Alangiaceae) in southern Primorsky Krai, Russia. *Amurian Zoological Journal*, vol. XVIII, no. 1, pp. 143–151. https://www.doi.org/10.33910/2686-9519-2026-18-1-143-151

Received 9 December 2025; reviewed 15 January 2026; accepted 5 February 2026.

Для цитирования: Маркова, Т. О., Маслов, М. В. (2026) Полужесткокрылые насекомые (Heteroptera) с *Alangium platanifolium* (Siebold et Zucc.) Harms (Alangiaceae) на юге Приморского края, Россия. *Амурский зоологический журнал*, т. XVIII, № 1, с. 143–151. https://www.doi.org/10.33910/2686-9519-2026-18-1-143-151

Получена 9 декабря 2025; прошла рецензирование 15 января 2026; принята 5 февраля 2026.