SJIF Impact Factor (2024): 8.675| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 9 | Issue: 6 | June 2024 - Peer Reviewed Journal

UDC 595.7

BIOECOLOGICAL FEATURES OF THE POLISTES WASP

Nagashybaeva Aigerim Khojas kyzy

Assistant, Department of Ecology and Soil Science, Karakalpak State University named after. Berdakha, The Republic of Uzbekistan

ANNOTATION

The article discusses the biological features of the polistes wasp. belonging to the genus Polistes. Worldwide, there are more than 200 recognized species of wasps polistes; social insects are widespread on the planet, inhabiting almost all biotopes. The polistes wasp is characterized by a variety of nest-building and protective instincts, structure and organization of families and populations.

KEY WORDS: *genus, family, species, female, male, phase, development, life cycle, nest.*

Insects are a class of invertebrate arthropods. Together with millipedes, they belong to the tracheal subphylum. About 1 million species of insects are known. They have the greatest diversity of all other animals on Earth [2].

Insects actively participating in the cycle of substances, insects play a global planetary role in nature. The order Hymenoptera is one of the largest orders of insects, which includes more than 155 thousand species from 9100 genera. They are combined into 2 suborders, 28 superfamilies, more than 100 families (89 recent and 37 extinct. The famous Swedish naturalist Carl Linnaeus was the first to combine insects with membranous wings, including bees, wasps and ants under the name Hymenoptera [3].

Polistes is a cosmopolitan genus of paper wasps and the only genus in the tribe Polistini. Common names for the genus include umbrella wasp, coined by Walter Ebeling in 1975 to distinguish it from other paper wasp species by the shape of their nests, and umbrella paper wasp [4].

Polistes is the largest genus in the family Vespidae, with over 200 recognized species. They usually build nests in human habitats. Polistes wasps are covered with short and inconspicuous hair, have a clypeus or clypeus with a pointed apex, have a wide genome along the entire length, the tubercle of the 1st metasoma in profile is almost straight or slightly curved, the tibia of the middle leg has two spurs, and the legs end in simple tarsal claws [5].

Polite wasps are a relatively small group of social insects (about 200 species are known on the globe), distributed on all continents except Antarctica. They inhabit mainly open landscapes and construct cardboard nests without a shell, which are attached to the substrate using a stalk. These social insects are widespread on the planet, inhabiting almost all biotopes [7].

These insects are characterized by a variety of nest-building and protective instincts, structure and organization of families and populations. They have two main ways of family and population functioning:

- - Resociality - the family is founded by single female founders; the existence of a family is limited to the life of one generation of reproductive individuals with cyclical repetition of the single and family phases; there is an incomplete separation of the two spheres of functioning; there are no morphologically separate castes
- - Nomosociality - a family is founded by a swarm, its existence is not limited by the life span of specific reproductive individuals, the family can function without the stage of resocialization; morphologically separate castes are observed in species that are characterized by complete separation of two spheres of functioning [8].

Polystea exhibits sexual dimorphism: males have seven externally visible metasomal segments, and females have six. Polistes species have single-layer umbrella-shaped nests with cells open to the air from below and no layer enveloping the nest. The nests are suspended from the surface by a petiole and are made of a paper-like substance consisting of a mixture of saliva and wood fibers chewed off from old and soft wood or dry twigs.

The general life cycle of Polysthes can be divided into four phases:

- foundation phase;
- working phase;
- reproductive phase;

SJIF Impact Factor (2024): 8.675| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 9 | Issue: 6 | June 2024 - Peer Reviewed Journal

 intermediate phase.

The founding stage begins in the spring when a lone "foundress" female or a small group of related females initiates nest construction. The wasps begin by forming a petiole, a short stalk that will connect the new nest to the substrate, and build a single brood cell at its end. Additional cells are added to the side in a hexagonal pattern, with each cell surrounded by six others. nests always retain their basic shape: petiolate, single-scaled, unprotected and open [6].

The eggs are laid by the founder directly into the blood cells and are guarded by the founder and helping females. After the first larvae hatch, the founder feeds them using gradual feeding. Each of this first seasonal brood of new paper wasps is exclusively female and destined for a subordinate work position within the nest; they do not establish their own nests, but instead assist their mother in caring for future sisters [2].

Some founder wasps do not build their own nests, but rather try to usurp another female's nests. These attempts at usurpation may or may not be successful, but almost always result in spectacular displays of aggression and violence. Females may also choose a more peaceful alternative reproductive strategy by joining the nest of a close relative and working as female helpers [5,6].

The breeding phase usually begins in early summer, about two months after the colony begins, with the appearance of the first workers. These new females take on most of the work responsibilities of the colony: foraging for food, caring for the brood, and maintaining the structure of the nest. Around this time, those females who helped establish the nest are driven from the nest by aggressive behavior on the part of the founder and leave either to establish their own nests at the end of the season or to usurp others [5,6].

The reproductive phase of a colony begins when the first reproductive females emerge from their brood cells. These reproductive individuals differ from their worker sisters in their increased levels of fat reserves and cryoprotective carbohydrate compounds, which allow them to survive the wintering period. These reproductive individuals pass on their genes directly to the next generation, while their worker sisters usually pass on their genes indirectly [5,6].

As soon as reproductive males appear, females and males leave the nest for nuptial flights, the so-called intermediate phase begins. Brood care and foraging decline, and worker numbers decline as dying individuals are no longer replaced by new ones. Internally, colonial aggression increases and nest social cohesion decreases [5,6].

The reproductive behavior of Polistes wasps provided one of the first pieces of evidence for mathematician-biologist W. D. Hamilton's theory of kin selection, formulated in 1964.

Morphologically, the founder and the subordinate reproductive members of the colony differ little. However, behavioral differentiation occurs among females both between and within generations.

The entire development cycle from the moment of egg laying to the emergence of the imago lasts on average 38 days. The lifespan of a working individual ranges from 21-40 days. The intensity of reproduction in polystyreous wasps strongly depends on the weather conditions of the warm season of the year [1].

Thus, insects of the genus Polistes are characterized by a variety of nest-building and protective instincts, structure and organization of families and populations.

LITERATURE

1. *Abasheev R.Yu. Ecological and biological features of polystyrene wasps (Hymenoptera, Vespidae, Polistinae) in Southwestern Transbaikalia // Bulletin of the Buryat State University. Biology. Geography. - 2010.- P. 162 -169.*
2. *Kipyatkov V. E. The world of social insects. - L.: Leningrad University Publishing House. 1991. 408 - p.*
3. *Nagashybaeva A. The ecological role and significance of the wasp (insecta: hymenoptera) in nature // "World Science" No. 6 (27) 2019. / science-j.com. - P.336-338.*
4. *Paper wasps https://ru.wikipedia.org/wiki/*
5. *Polistes – Polistes https://ru.wikibrief.org/wiki/Polistes*
6. *Polistes / https://hmong.ru/wiki/Polistes*
7. *Rusina L.Yu. Population structure and social organization of ospolites (HYMENOPTERA: VESPIDAE) in the lower Dnieper // diss. 1999-260 pp.*
8. *Rusina L. Yu. Principles of organization of the population of polystine wasps (Hymenoptera, vespidae) // Zoological Journal, 2015, volume 94, No. 10, p. 1226-1240*