

MORPHOLOGY AND DISTRIBUTION IN NATURE OF ROSA ECAE AITCH

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<https://doi.org/10.5281/zenodo.15664799>

Abstract. This article provides a detailed analysis of the morphology, ecology, and distribution of *Rosa ecae* Aitch. *Rosa ecae* plays an important role in the natural environment for its beautiful flowers, fruits, and as a food source. The article reviews the morphological characteristics of the plant, including its leaves, flowers, fruits, and thorns. It also analyzes the growth conditions and ecological requirements of *Rosa ecae*, its habitat, and the pollination process. In terms of distribution, this plant is mainly distributed in the Central Asian and Middle Eastern regions, especially in the mountainous regions of Iran, Afghanistan, Pakistan, and India. *Rosa ecae* is ecologically important and is a food source for various animals and pollinators.

Keywords: *Rosa L*, *Rosa ecae*, Central Asia.

Introduction. The genus *Rosa L.* is a diverse group of shrubs native to the temperate and subtropical regions of the Northern Hemisphere, comprising approximately 258 species (POWO, 2025). These species hold considerable ecological, ornamental, and economic importance worldwide. Among them, *Rosa ecae* Aitch. is easily distinguished by its bright yellow flowers and distinctive armature. This species is native to a geographic range extending from Afghanistan through Central Asia to the Western Himalaya and typically inhabits temperate biomes. Despite its relatively wide distribution in the mountainous regions of Central Asia, *Rosa ecae* remains underrepresented in both floristic studies and horticultural literature. This paper aims to provide a comprehensive account of the morphology, habitat, and distribution of *Rosa ecae*, addressing gaps in current knowledge and highlighting its botanical significance in Uzbekistan.

The species of the *Rosa* genus are mainly used for grafting roses and are widely used to create new rose varieties. For this purpose, the database <https://www.rosebook.ru>, which is widely distributed and useful for everyone on earth, has been created (Figure 2). This database contains all rose varieties, a key to identifying species, project participants, illustrations, propagation methods, etc. One of the most important works devoted to the *Rosa* genus is “The Complete Book of Roses”, published by Gerd Krüssmann in 1981. The work covers an analysis of scientific research conducted in almost all areas of the genus. In particular, detailed information is provided on the study of the genus, its cultivation, biotechnology, tissues, bud development, dependence on soil and climatic factors, gardening (garden design, preservation in different seasons, etc.), grafting, the effect of various substances on cultivation, irrigation, indoor cultivation, greenhouse cultivation, proper chemical fertilization, use in fields, insect pests and diseases, Indian Rose growers, etc.

Material and Methods. In May 2024, we conducted a field survey to capture photographs for creating detailed illustrations (Figure 1) and to record the current distribution of *Rosa ecae*. Additionally, occurrence data were obtained from the Global Biodiversity Information Facility (GBIF), iNaturalist platforms and Ismonova et al. (2024) to generate a comprehensive distribution

map (Figure 2). For the species description, we referred to authoritative botanical references, including *Определитель растений Средней Азии*, том 5, and *Флора СССР*, том 10.

Results. Morphology. This shrub reaches up to 1 meter in height and features flexuous shoots with gray bark. It is characterized by uniform prickles—either purple or whitish—which are erect, often inclined upward, long, thin, and flattened, with a significantly broadened, decurrent base. These prickles are often densely crowded and contiguous. Pricklets and bristles are absent. The petioles and rachis are often finely glandular. Stipules are narrow with divergent auricles and finely glandular margins. The plant typically has 5–9 (occasionally up to 11) small leaflets, each 2–7 mm long, glaucescent green, oblong or orbicular in shape, and dentate or bidentate with 4–9 mainly obtuse teeth per side. Leaf surfaces are glabrous above and either glabrous or pubescent beneath, with minute yellowish glands. Flowers are solitary and small, usually around 1.5 cm in diameter (rarely up to 2.5 cm). Pedicels are thin and smooth, about as long as or slightly longer than the very small hypanthium. Sepals are simple, lanceolate, 4–5 mm long, with dense hairs on the upper surface and often lightly pubescent below. They are persistent and either spreading or recurved. The petals are lemon-yellow and longer than the sepals. Fruits are subglobose, very small (6–8 mm long), black-violet in color, and borne on slender pedicels (Figure 1).

Phenology. Flowering occurs during May and June.

Ecology. It grows on fine-earth, gravelly, and rocky slopes, outcrops of variegated rock formations, in shrub thickets, and juniper woodlands. The species is found across a wide elevational range, including low mountains, mid-elevations, and high mountainous zones. It has various uses, including medicinal, edible, ornamental, and as a honey plant.

Distribution. This species is distributed across Central Asia and northern Afghanistan. In Central Asia, it occurs in Kazakhstan, Kyrgyzstan, Uzbekistan, and Tajikistan, where it is widespread in the Tien Shan and Pamir-Alay mountain systems. In Afghanistan, it is found in the northern and northeastern mountainous regions. Within the Tien Shan, it inhabits ranges such as Susamyrtau, Talas Alatau, Chatkal, Fergana, Kuramin, and Mogoltau. In the Pamir-Alay, it is found in the Alai, Turkestan, Zeravshan, Gissar, Darvaz, Peter the First, Karateghin, Babatag, and Kugitang Ranges. The species also occurs in the low mountain areas of southern Tajikistan, including the Gazimalik, Aktau, and Karatau mountains.

According to phytogeographic

Usage. Medicinal, edible, ornamental, and melliferous (honey-producing)

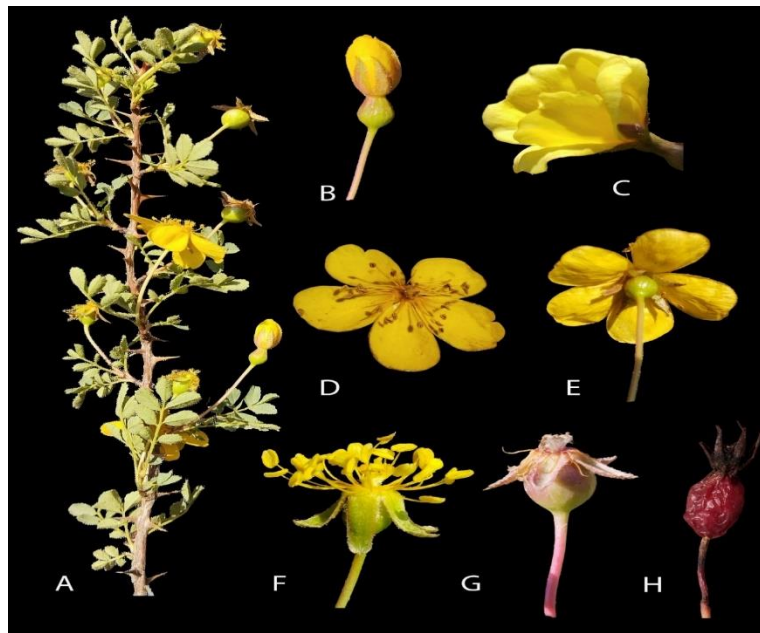


Figure 1. Morphological features of *Rosa ecae* illustrating vegetative and floral structures.

A. Habit of the plant showing compound leaves and flowering branches, B. Flower bud, C. Lateral view of an open flower, D. Front view of flower showing five yellow petals and numerous stamens, E. Rear view of flower with sepals visible, F. Post-anthesis flower showing persistent stamens and hypanthium, G. Developing fruit after petal and stamen fall, H. Mature fruit (hip) with persistent sepals

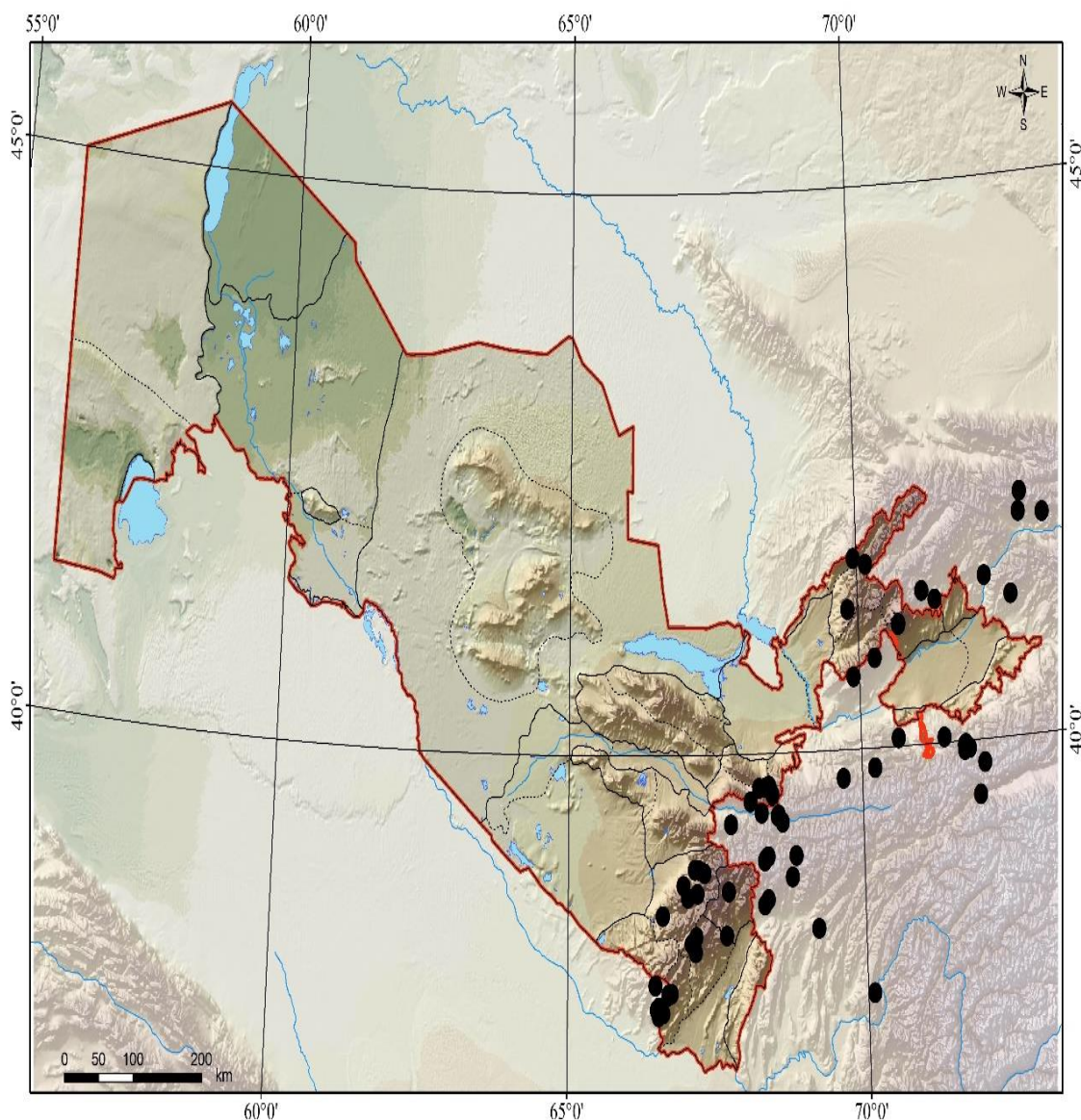


Figure 2. Map of distribution *Rosa ecae* in Uzbekistan and adjacent countries

Conclusion

Rosa ecae Aitch. represents a distinctive and ecologically significant component of the mountainous flora across Central Asia and northern Afghanistan. Despite its wide geographic distribution and diverse habitats ranging from low to high mountain zones, this species remains relatively understudied. Our morphological description with illustration, supported by field observations and extensive occurrence data, fills important gaps in the botanical understanding of *R. ecae*. Its ecological versatility, alongside its medicinal, edible, ornamental, and melliferous uses, underscores the species' multifaceted value to local communities and ecosystems. Highlighting the botanical importance of *Rosa ecae* in Uzbekistan and the broader Central Asian region may foster increased attention toward its conservation and sustainable utilization, particularly as mountain environments face growing anthropogenic pressures.

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