



Variability in hip characters in *Rosa* species

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ABSTRACT

The reddish 'fruit' of rose is commonly known as its hip. Rose hips are formed when the tip of a rose stem swells up after a flower has faded. Species roses, shrub roses, ramblers and other roses that are "close to nature" (*R. gallica*, *R. rugosa*) are the most likely to have noticeable hips. Twenty three rose species were evaluated for hip characters. Rose hips were very variable among the species. Average hip length and diameter varies between 0.5 to 2.8 cm and 0.1 to 2.7 cm, respectively. Hip shape viz., sub-globose, urn-shaped, ellipsoid and spindle-shaped were observed among the species. The range for number of hips was found to be 5 to 45 per cluster. *Rosa rugosa* recorded larger hip size. Majority of the species showed orange and deep red hip color. *R. moyesii* (blue-green foliage and bright to orange hips), *R. glauca* (bright scarlet hips), *R. pimpinellifolia* (tiny, red-black hips) with attractive hips having ornamental value can be utilized in landscaping and for garden purposes.

Keywords: *Rosa* species, hips, ornamental, variability

Rose is the most popular garden plant and cut-flower in the world. Due to its importance, rose breeding and improvement programmes have received great attention throughout the world. Wild species have always played greater role in present day roses in many ways. Therefore, there is a great deal of interest in studying variability existing among various species, their characterization and adaptability for effective use in improvement programmes. *Rosa* species grow wild in several regions of the world and most are of ornamental value only. Temperate climate generally encourages growth and fruiting in *Rosa* species. Majority of the species are found in the wild in China, Myanmar (Burma), Himalayan region, Central Europe and North East Asia. The species gradually spread from the Northern hemisphere from Alaska and Siberia, South to Mexico, India, the Philippines and Ethiopia. Rose hips are the enlarged floral cups (receptacles) which surround numerous small, hard dry fruits (achenes) commonly called seeds. Rose hips are bright orange and oval and become fleshy, but are not true fruits. Apart from having ornamental value, rose hips have attained great importance for their various economic uses. Rose hip dry pulp is exported mainly to European countries. The dry pulp is used in herbal teas and marmalades and as a pigment for laying hens and broiler chickens (Burgos, 1976; Cortés, 1976; Larraín, 1978). It

contains large amounts of Vitamin C (1000-2000 mg/100g), riboflavin, pectin, nicotinic acid and malic acid (Israel and Benado, 1977). The objective of this study was to evaluate differences in hip characteristics, viz., size, colour and shape of rose hips under Ahrensburg, Germany conditions.

Sixty *Rosa* species are maintained at the Institute for Ornamental Plant Breeding, Ahrensburg, Germany. Twenty three hips from each of the species *R. acicularis*, *R. alba*, *R. arvensis*, *R. glutinosa*, *R. helenae*, *R. macrantha*, *R. macrophylla*, *R. majalis*, *R. mollis*, *R. moyesii*, *R. multiflora*, *R. nitida*, *R. nutkana*, *R. pendula*, *R. pimpinellifolia*, *R. roxburghii*, *R. rubinigosa*, *R. rubrifolia*, *R. rubus*, *R. rugosa*, *R. rugosa alba*, *R. tomentosa* and *R. wichuriana* were collected and observations were made on hip characters viz., size, number, color and shape according to the rose description guide.

A great variation is observed in size, shape and colour amongst rose hips (Table 1 and Plate 1). Rose hips were highly variable among species. Average hip length and diameter varied between 0.5 to 2.8 cm and 0.1 to 2.7 cm, respectively. *Rosa pimpinellifolium* had tiny hips. The range for number of hips was found to be 5 to 45 per cluster. *Rosa rugosa* recorded larger hip size. Hip shape viz., sub-globose, urn-shaped, ellipsoid and spindle were observed

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Table 1. Qualitative and quantitative characters in hips *Rosa* species

| Species | Shape of hip | Length of hip (cm) | Diameter of hip (cm) | Color of hip | Vestiture of hip | Number of achenes |
|---------------------------|--------------|--------------------|----------------------|--------------|------------------|-------------------|
| <i>R. glutinosa</i> | Spindle | 1.3 | 0.7 | Orange red | Hispid | 18 |
| <i>R. macrophylla</i> | Oblong | 2.1 | 1.0 | Orange red | Hispid | 6 |
| <i>R. micrantha</i> | Spindle | 2.0 | 1.0 | Orange | Hispid | 5 |
| <i>R. multiflora</i> | Round | 0.7 | 0.5 | Orange red | Glabrous | 6 |
| <i>R. nitida</i> | Globose | 1.4 | 0.9 | Orange red | Glabrous | 10 |
| <i>R. rubinigosa</i> | Oblong | 1.4 | 0.1 | Orange red | Glabrous | 18 |
| <i>R. rubrifolia</i> | Round | 1.4 | 1.1 | Orange red | Hispid | 16 |
| <i>R. rugosa</i> | Globose | 2.8 | 2.7 | Orange red | Glabrous | 10 |
| <i>R. tomentosa</i> | Round | 1.1 | 0.9 | Orange red | Glabrous | 6 |
| <i>R. wichuriana</i> | Round | 0.8 | 0.8 | Orange red | Glabrous | 10 |
| <i>R. acicularis</i> | Urn | 1.0 | 0.5 | Dark red | Glabrous | 15 |
| <i>R. alba</i> | Oval | 0.8 | 0.5 | Red | Glabrous | 16 |
| <i>R. arvensis</i> | Oval | 0.5 | 0.3 | Red | Glabrous | 18 |
| <i>R. helenae</i> | Oval | 0.7 | 0.6 | Orange red | Hispid | 22 |
| <i>R. majalis</i> | Round | 1.4 | 1.3 | Scarlet | Glabrous | 24 |
| <i>R. mollis</i> | Spindle | 1.5 | 1.2 | Red | Glabrous | 20 |
| <i>R. moyesii</i> | Urn | 2.3 | 2.0 | Orange red | Glabrous | 40 |
| <i>R. nutkana</i> | Round | 1.4 | 1.3 | Red | Hispid | 8 |
| <i>R. pendula</i> | Pear | 2.5 | 2.0 | Red | Glabrous | 20 |
| <i>R. pimpinellifolia</i> | Oval | 0.5 | 0.3 | Red black | Glabrous | 45 |
| <i>R. rubus</i> | Oval | 0.5 | 0.4 | Orange red | Glabrous | 19 |
| <i>R. roxburghii</i> | Round | 0.8 | 0.7 | Red | Hispid | 20 |
| SE | - | 0.14 | 0.13 | - | - | 2.26 |
| S.D (s) | - | 0.67 | 0.63 | - | - | 10.60 |
| CV | - | 51.14 | 66.31 | - | - | 64.24 |

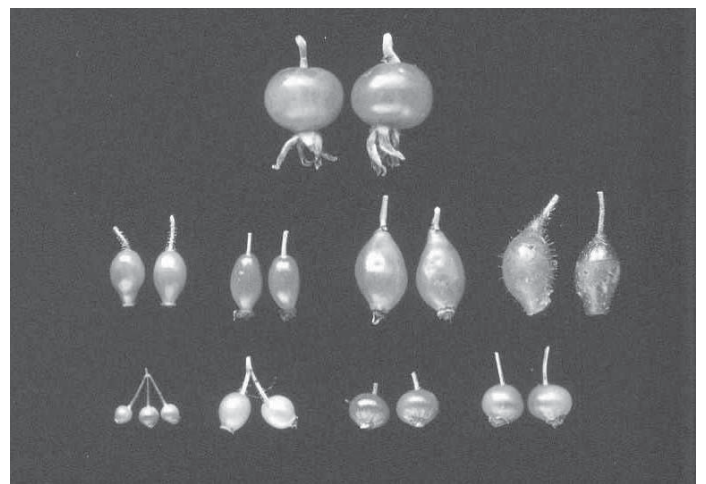


Plate 1. Variability for hip characters in *Rosa* species

among the species. Majority of the species showed orange and deep red hip color. Similarly, in Chile, variability for hip size, pulp thickness and ascorbic acid was observed among rose hips collected and evaluated from 60 different locations. Morphological differences are evident in the wild material, indicating that more than one species (and probably several sub species and ecotypes) have developed

since introduction (Joublan *et al.*, 1996).

Rosa moyesii (blue-green foliage and bright to orange hips), *Rosa glauca* (bright scarlet hips), *R. pimpinellifolia* (tiny, red-black hips) with attractive hips having ornamental value can be utilized in landscaping and for garden purposes.

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