

# A SHORT NOTE ON THE GENUS *NASTURTIIUM* R. Br. (CRUCIFERAE) AND A NEW HYBRID STATE FROM THIS GENUS FOR IRAN

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The genus *Nasturtium* with two species, *N. officinale* and *N. microphyllum*, distributes in the wet and damp places of Iran. These two species make a hybrid state, *Nasturtium x sterile*, with intermediate morphological and chromosomal features. This hybrid state is reported for the first time in Iran. Ecology and general distribution of the hybrid and its parent taxa are discussed. Moreover *N. microphyllum* is reported from more localities comparing to the one locality in Flora Iranica.

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**Key words.** Cruciferae, *Nasturtium*, *N. x sterile*, north of Iran, new hybrid.

یادداشت‌هایی روی جنس علف چشمه در ایران و گزارشی از یک وضعیت هیبریدی در آن  
علیرضا نقی نژاد

جنس *Nasturtium* با دو گونه *N. officinale* و *N. microphyllum* در بسیاری از مکانهای مرطوب و باتلاقی کشور پراکنده است. این دو گونه باعث تولید یک تاکزون هیبرید با ویژگی کاملاً حدواسط می‌شود. اکولوژی و پراکنش این هیبرید و همچنین گونه‌های والد مورد بحث قرار می‌گیرد. همچنین *N. microphyllum* برای اولین بار از چند موقعیت مختلف در شمال ایران گزارش می‌شود.

## INTRODUCTION

*Nasturtium* R. Br., *Cardamine* L., *Rorippa* Scop. have been known as aquatic genera of the family *Cruciferae* in Iran (Hedg, 1968). These genera are thought to be closely related and are placed together in the tribe *Arabideae* DC. (Al-Shehbaz, 1988). *Nasturtium* which is often reduced to a synonymy of *Rorippa*, is recognized as a distinct genus with five species in the world (Al-Shehbaz & Price, 1998). Moreover, the results of molecular analysis do not support the incorporation of *Nasturtium* within *Rorippa* (Franzke, et al. 1998). The most common and widespread species of the genus *Nasturtium* are *N. officinale* R. Br. and *N. microphyllum* (Boenn.) Rchb.. Both of which are native to Eurasia and northern Africa and widely naturalized elsewhere (Al-Shehbaz & Price, 1998). The first species is more common and is considered as watercress of commerce. Although *Nasturtium officinale* grows on the wet habitats in most parts of Iran but *N. microphyllum* was known as a species that confined in one counted locality (Bakhtiari, Belu) (Hedge, 1968). From the few years to now, several other localities were found by the author in Gilan and Mazandaran provinces and therefore added to last

distributional range of *N. microphyllum*. There is a hybrid taxon between *N. officinale* and *N. microphyllum* in the areas that two species meet. This hybridization event is reported for the first time in north of Iran.

## MATERIALS AND METHODS

Specimens of *Nasturtium* in Herbaria W, TUH, IRAN, TARI (abbreviation according to Holmgren et al. 1990) were studied. The genus *Nasturtium* contains reticulate seeds. The counting of areolae number on each side of seed surface was carried out by stereomicroscope (Nikon: SMZ-1 with 30 x magnification). Also two digital photos from seed surface was prepared with using of this stereomicroscope.

## RESULTS AND DISCUSSION

### *Nasturtium microphyllum* in North of Iran

**Materials examined.** Gilan province, Lahijan, Hassanalideh, near to Amirkelayeh wetland, -26 m, 20.6.2001, Naqinezhad, 27873-TUH!; Gilan: Lahijan, Saharkhiz, near to the Pasgah, -25 m, 27.5.2000, Naqinezhad, 27278-TUH!. Gilan: Lahijan,

Hassanbekandeh, near to the Amirkelayeh wetland, -25 m, 27.5.2000, Naqinezhad, 27279-TUH!. Mazandaran province, Tunekabon, Nashtarud, Khoshkedaran, near to Khoshkedaran natural national monument, -20 m, 9.6.2003, Naqinezhad, 30835(Partly)-TUH!.

Hedge in Flora Iranica (Hedge, 1968) reported this species from Iran based on one record: Bakhtiari, Belu, in steam pool, 1 ft. deep, 7.5.1940, Koelz, 15216-W! Author has not ever seen any specimens of this species in herbaria TARI and IRAN.

A specimen in Herbarium IRAN (Bakhtiari: Semirum, Darreh-Abshar, 2450 m, 6.6.1974, Iranshahr-30600E) was wrongly determined under *Nasturtium microphyllum* while this specimen must be changed to *Barbarea plantaginea* DC.

### ***Nasturtium x sterile* (Airy Shaw) Oefelein Fig. 1**

Materilas examined: Gilan: Bandar-e Anzali, in wet places around Bandar-e Anzali lagoon, -26 m, 14.5.1971, Rechinger, 39631-W!; Mazandaran: Tunekabon, Nashtarud, Khoshkedaran, in the margin of Khoshkedaran forest(Natural national monument), -25 m, 13.6.2003, Naqinezhad, 30833-TUH! and Naqinezhad, 30835(Partly)-TUH!.

Hedge had predicted the occurrence of this hybrid taxon in the Flora Iranica area and mentioned one specimen from Pakistan with hybrid features (Hedge, 1968).

### **Taxonomy, habitat and chromosome number**

The fruits of *Nasturtium officinale* are shorter and wider compared with *N. microphyllum*. *N. officinale* has coarsely reticulate seeds with less than 60 areolae per side in contrast to the moderately to minutely reticulate seeds with less than 130 areolae per side found in *N. microphyllum*. Moreover, *N. officinale* is a tetraploid species ( $2n=4x=32$ ) while *N. microphyllum* is octoploid ( $2n=8x=64$ ). The hybrid between these two species is either fertile or sterile. Fully fertile hybrids are morphologically intermediate between their parent species with between 60 and 120 areolae on each side of the seed surface (Bleeker et al. 1997). Also It is interesting that the chromosome number in *N. x sterile* involves also intermediate state ( $2n=6x=48$ ). The counting of areolae number on my specimens confirms the upper results. The seeds of *N. officinale* contain 40-50 areolae per side while that of *N. microphyllum* contain 100-130. Because of non-seed fruits or unripened seeds, the counting of seed areolae was impossible in *N. x sterile* specimens.

The hybrid widely occurs in ditches and small brooks with running water but also in ponds with a high fluctuation of water level in Central Europe (Bleeker & Hurka 1997). Most of the locations inhabited by *N. x sterile* were created by man in connection with landscape melioration. The formation and persistence

of *N. x sterile* is favoured by human activities. On the British Isles the hybrid has traditionally been cultivated as a crop plant (brown cress). *N. x sterile* is more vigorous than the octoploids and is quicker in establishing itself from cutting (Manton, 1935) These vegetative capabilities should provide this hybrid with a fitness advantage in ditches regularly managed (Bleeker et al. 1999). *Nasturtium x sterile* grows within irrigation canals or small brooks within ricefields and forest edges where are influenced by human or domestic animals.

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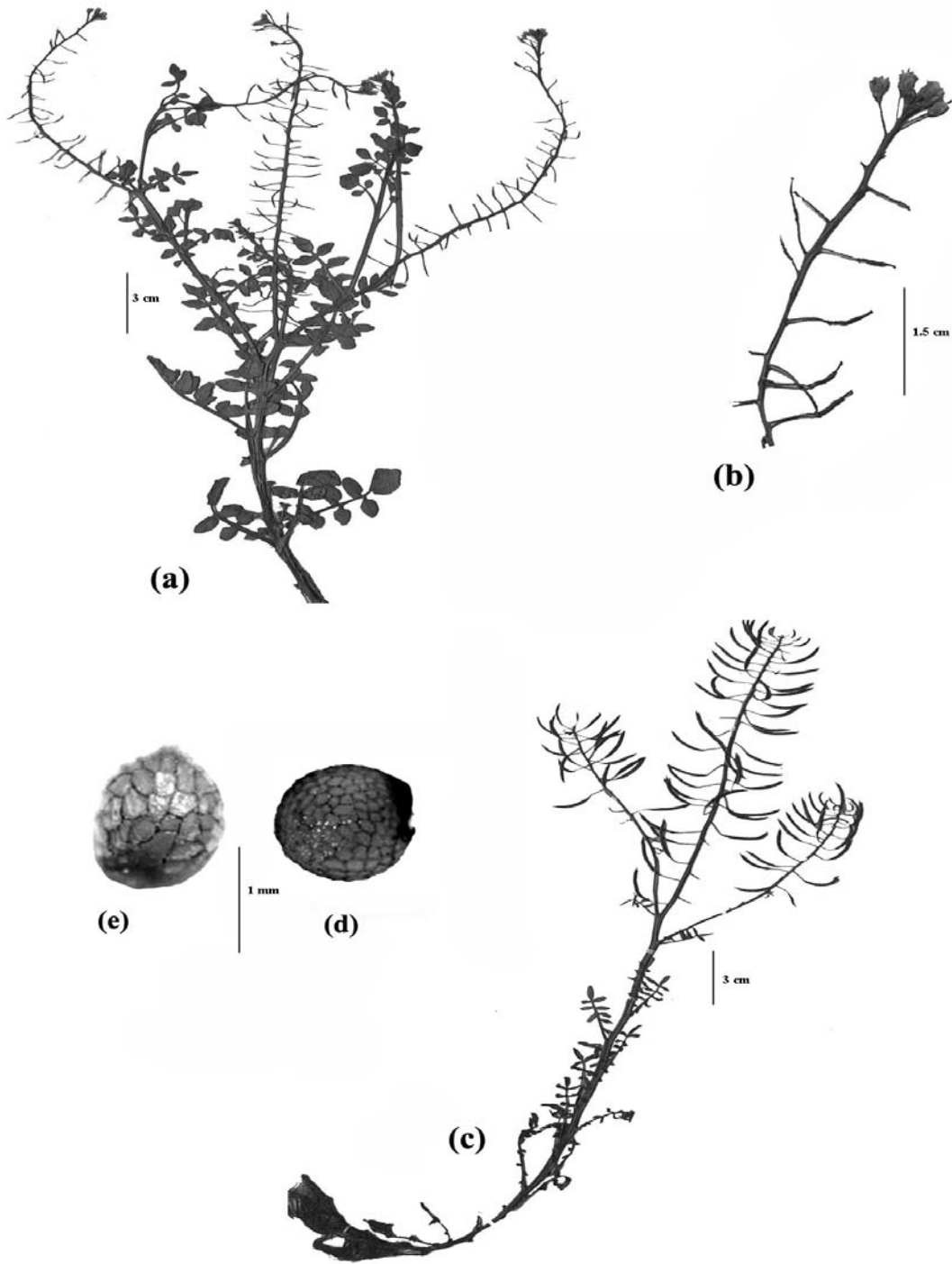


Fig. 1. *Nasturtium x sterile*: habit (a), fruiting branch (b) [photo from 30833-TUH]; *Nasturtium microphyllum*: habit (c), seed (d) [photo from 27278-TUH]; *Nasturtium officinale*: seed (e).