

COMPARISON IN REPRODUCTIVE CAPACITY OF WILD AND CULTIVATED POPULATION OF MARSILEA SPECIES

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The present paper describes comparison in reproductive capacity of wild and cultivated population of three *Marsilea* (*M. minuta*, *M. rajasthanensis* and *M. shashibalii*) species. It becomes clear that wild populations of both *M. minuta* and *M. rajasthanensis* show enhanced reproductive capacity in comparison to their respective cultivated populations. However, reproductive capacity appears to be almost equal in both wild and cultivated populations of *M. shashibalii*.

Keywords : *Marsilea*; Reproductive capacity.

The sporocarps of *Marsilea* is highly specialised and unique structure specially in its being the toughest amongst Fern. An example of its toughness was provided by Allopp¹ who was successful in germinating sporocarps picked from poisoned herbarium specimens of various ages. Feller² studied the sporocarp wall of *M. hirsuta* in details. Bloom³ studied the heat resistance of sporocarp wall in *M. quadrifolia*. According to Gupta⁴ the wall structure is nearly same in all the species. Bhardwaja and Sen⁵ also observed that sporocarps of *M. rajasthanensis* could withstand sustained heating at least upto 54 hours at 65°C. Malone and Proctor⁶ reported the dispersal of *M. mucronata* by water and flying birds. Bhardwaja⁷ has described wind dispersal in some arid zone *Marsilea* species.

Megagametogenesis in *Marsilea* has been investigated by various workers. Campbell^{8,9} made a report on megaspore germination of *M. aegyptiaca* and *M. vestita*. Strasburger¹⁰ studied the apogamous behaviour of megagametophyte in *M. drummondii*. Schultz¹¹ studied in detail the macrogametophyte of *Pilularia globulifera* and *M. quadrifolia*. A detailed investigation of megagametophyte development in *M. diffusa*, *M. hirsuta* and *M. augustifolia* was undertaken by Demalsy-Feller¹². Bloom¹³ and Bloom and Nicholas¹⁴ studied factors influencing rhizoid formation in female

gametophyte of *M. drummondii*. Tourte et al¹⁵. investigated some aspects of oogenesis in *M. vestita*.

Ripe sporocarps of *M. minuta*, *M. rajasthanensis* and *M. shashibalii* collected (both wild and cultivated populations). Five sporocarps of each species were scarified and for germination kept in a petridish containing tap water. Observation made of sorophore extrusion and sporeling formation. Reproductive capacity was calculated by the following formula.

Reproductive capacity =

$$\frac{\text{Total Number of Spores Germinated}}{\text{Total Number of Spores}} \times 100$$

A perusal of table 1 reveals that the wild populations of both *M. minuta* and *M. rajasthanensis* show enhanced reproductive capacity in comparison to their respective cultivated population. However, reproductive capacity appears to be almost equal in both wild and cultivated populations of *M. shashibalii*. It is evident that in wild population of *Marsilea* species show high reproductive capacity in unfavourable conditions of environment. It means adaptations develop for survival of species in harsh conditions and reproductive capacity increased in wild population. The observation represented graphically in Fig. 1.

Table 1. Reproductive capacity of wild and cultivated population of *Marsilea* species

S.No.	Parameters	<i>M. minuta</i>		<i>M. rajasthanensis</i>		<i>M. Shashiballi</i>	
		WP	CP	WP	CP	WP	CP
1.	No. of megaspore/sporocarp	68	18	06	11	55	50
2.	No. of germinating megaspore	50	10	05	07	40	35
3.	Reproductive capacity (%)	73.5	55.5	83.3	63.6	72.7	70.0

WP + Wild Populations; CP = Cultivated Populations

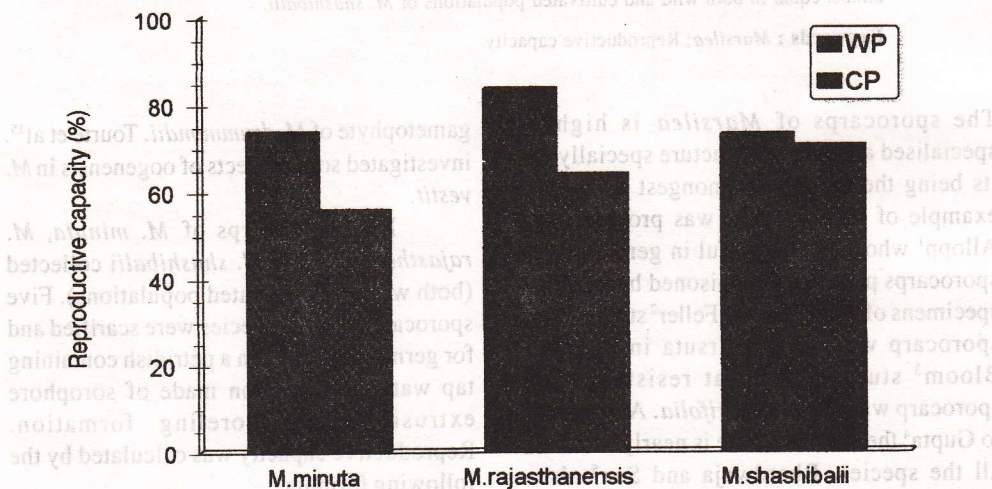


Fig. 1 : Graph show comparison in reproductive capacity of wild and cultivated population of *Marsilea* species.

The Phenomenon of reproductive capacity has been studied from long time in many *Marsilea* species and other plants. Wadhvani¹⁶ and D'Souza¹⁷ observed that increasing dryness of the habitat play a significant role in evolutionary divergence at species level. These investigations reveal that the wild populations of both *M. minuta* and *M. rajasthanensis* show high reproductive capacity in comparison to their respective cultivated populations. But these variation in *M. shashibalii* is less, such type of calculations of reproductive capacity has been taken up first time so far as these Rajasthan State species are concerned.

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