

M. SANJAPPA*: **Chromosome numbers in some species of
Desmodium Desv. and *Alysicarpus*
Neck. ex Desv. (Leguminosae)**

M. サンジャ ッパ*: *Desmodium* および *Alysicarpus*
数種の染色体数

The genera *Desmodium* and *Alysicarpus* were established by Desvaux in 1813, though the later genus was first visualised by Necker in 1790. Previous to the establishment of these genera most species of *Desmodium*, *Alysicarpus* and other related genera were treated under the genus *Hedysarum* (Linnaeus 1753). During the segregation of different species of *Hedysarum*, 33 species were included in *Desmodium* and 3 species in *Alysicarpus*. Since then, several new species were added to the genera under consideration from different parts of the world. Presently there are about 350 species in *Desmodium* and 35 species in *Alysicarpus* (Hutchinson 1964).

Dalzell (1851) working on western Indian plants described *Alysicarpus parviflorus* and named some collections from the same region as *Alysicarpus rotundifolius* (Dalzell, MSS.-K). Baker (1876) transferred these 2 species of *Alysicarpus* to *Desmodium* (thus validating the specific epithet 'rotundifolius' of Dalzell under *Desmodium*) as *D. parviflorum* (Dalz.) Baker and *D. rotundifolium* (Dalz.) Baker. However, Baker did not indicate any reason for this transfer. Baker's treatment was later followed by Woodrow (1899) and Cooke (1901). Prain (1897) states that "these 2 species do not accord at all well with the generic definition of *Desmodium* and are more conveniently referred to *Alysicarpus* in which they were originally placed by Dalzell". He also suggested that these 2 species and 2 other closely related *Alysicarpus racemosus* Benth. and *A. belgaumensis* Law ex Wt. be placed in a group intermediate between the 2 genera. Gamble (1915), Schindler (1927) and Ohashi (1971) have also treated *Alysicarpus parviflorus* in *Alysicarpus*. While, Schindler (l.c.) described yet another closely related species *A. beddomi*. Van Meeuwen (1967) has renamed *Desmodium parviflorum* (Dalz.) Baker (non Mart. & Galeetti 1843) as *D. alysi-*

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carpoides. In a note under the species he states that "a critical study of the genera *Desmodium* and *Alysicarpus* may lead to the merger of 2 genera as they are separated by flat or terete pod character". Sanjappa (1982) renamed *D. rotundifolium* Baker (non DC. 1825) as *D. ritchiei*. Babu (1977) remarks that *Alysicarpus procumbens* (Roxb.) Schindler is a unique species in the genus having compressed pods—a character that distinguishes *Alysicarpus* from *Desmodium* and also feels that the combination of characters in this species may suggest the reduction of genus *Alysicarpus* to *Desmodium*. In view of the above transfer of some species from *Alysicarpus* to *Desmodium* and doubts raised with regard to their individual generic status, it was thought worthwhile to study the chromosome number and morphology in the species of the 2 genera.

Results and discussion In the present study the chromosomal evidences have been used to evaluate the generic status of *Desmodium* and *Alysicarpus* with special reference to *D. alysicarpoides*, *D. ritchiei* and *Alysicarpus procumbens*.

Desmodium alysicarpoides and *D. ritchiei* are procumbent to erect herbs growing along western Peninsular India and the latter is apparently endemic to the region. While, *Alysicarpus procumbens* is an annual prostrate herb of western, central and southern India.

The meiotic chromosome counts were made from pollen mother cell smears. Floral buds of suitable size were collected in modified Carnoy's fluid (6:3:1). Young anthers were subsequently removed and squashed in 2% aceto-carmine.

In *Desmodium alysicarpoides* and *D. ritchiei* the pollen mother cells showed 11 bivalents at metaphase I (Fig. 1-1 and -2), thus both the species resemble *Desmodium* in the haploid number. *Alysicarpus procumbens* showed 8 bivalents at metaphase I (Fig. 1-3 and -4) as in other species of the genus. The chromosome numbers known so far in various species of the genera under study (Darlington & Wylie 1955, IOPB chromosome number reports 1964-1983) reveal the basic numbers $X=10$ and $X=11$ for *Desmodium* and $X=8$ for *Alysicarpus*. The meiotic and somatic chromosomes investigated in different species of *Desmodium* and *Alysicarpus* (Sanjappa 1977, Sanjappa & Bhatt 1978), generally show comparatively higher basic number and short chromosomes in *Desmodium* and low basic number and long chromosomes in *Alysicarpus*. The karyotypes of different species of *Alysicarpus* show a remarkable uniformity in number, size and types of chromosomes (Sanjappa 1977, Sanjappa & Bhatt 1978) compare to

those of *Desmodium*. The distinct differences in basic number and karyotypes support individual status for the 2 genera, though, they are mainly differentiated on pod character. This is further supported by palynological observations in *Desmodium* (Ohashi 1973, Mitra et al. 1979) and *Alysicarpus* (Ohashi 1971). *Desmodium alysicarpoides* and *D. ritchiei* having $n=11$ and smaller chromosomes should be retained in *Desmodium* than in *Alysicarpus*.

Ohashi (1971) treats *Desmodium alysicarpoides* under *Alysicarpus* (as *A. parviflorus* Dalz.) based on pollen morphology—as the species shows *Alysicarpus racemosus* type of pollen, while, Mitra et al. (1979) based again on pollen studies retain the species under *Desmodium* (as *D. parviflorum* Baker) and supports its inclusion in section *Nicolsonia* of the subgenus *Sagotia* of Ohashi's classification (1973). These contrasting observations on pollen morphology of *D. alysicarpoides* calls for a detailed study of the pollen in all the species investigated here. However, it will be interesting to draw support from future embryological,

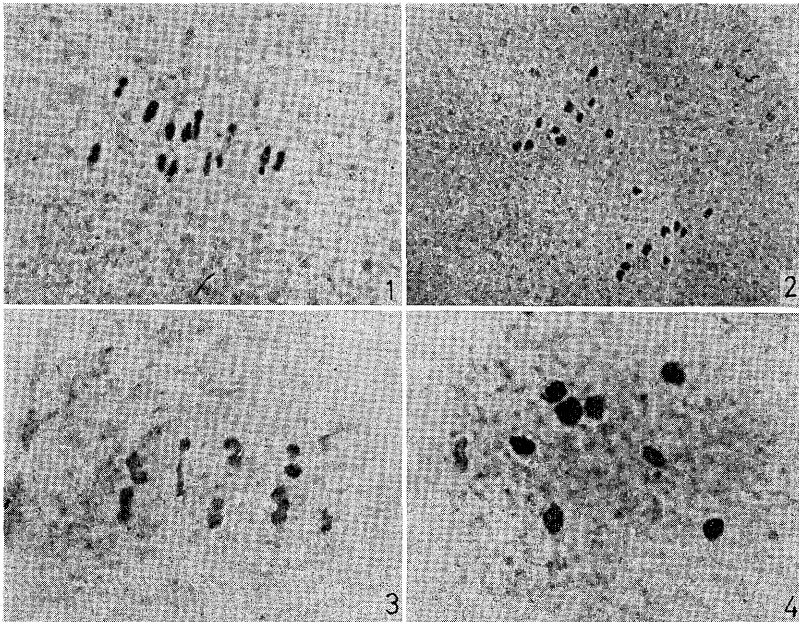


Fig. 1. 1. Metaphase I ($n=11$) of *Desmodium alysicarpoides*. 2. Anaphase I ($11+11$) of *Desmodium ritchiei*, 3 & 4. Metaphase I side view and polar view ($n=8$) of *Alysicarpus procumbens*.

anatomical and chemical studies to further validate the status of 2 genera and their species investigated presently. Until such a study is completed, it seems best to treat them as distinct genera, and *D. alysicarpoides* and *D. ritchiei* in *Desmodium* and *Alysicarpus procumbens* in *Alysicarpus*.

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Desmodium および *Alysicarpus* 数種の染色体数を観察した。*D. alysicarpoides* は $n=11$ であり、これは初めての報告である。同種および *D. ritchiei* ($n=11$), *Alysicarpus procumbens* ($n=8$) はその染色体数から考えて、前 2 者を *Desmodium* に、後者を *Alysicarpus* におくことは妥当と思われる。

□Abe, Tohru: **Studies on the family Peridiniidae. An unfinished monograph of the armoured dinoflagellata.** viii+409 pp. 1981. 阿部徹遺稿出版会 (アカデミア洋書KK内), 東京. ¥15,000. 日本産渦鞭毛藻類のペリディニウム科のモノグラフである。4 属 85 種を収録し、うち 1 属 19 種は新分類群である。この科の日本に産する 2 亜科、ダイプロサリス亜科とペリディニウム亜科について、分類の歴史、細胞の内部形態と外部形態、特に上殻、下殻、横溝、縦溝の鎧板の形状と配列及び大きさの変異など、およそ光学顕微鏡でとりあげるべきすべてと思われる多くの形質について 130 頁余に及ぶ詳細な記述があり、その後に種の記述が続く。この生物群についての著者の分類学の力量は定評のあるところで、正確かつ精細な種の記載と精緻な形態図は著者の積年の研究成果の粋を見る思いである。著者の阿部徹博士は 1925 年東京帝国大学理学部動物学科を卒業し、1965 年法政大学を停年退官するまで一貫して有殻渦鞭毛藻類の分類に従事した原生動物学者で、1971 年に没した。本冊は遺稿の一部で、このあとにケラティウム属の出版が続くと聞く。渦鞭毛藻は赤潮や毒性プランクトンの主要構成生物として近時頗る注目を浴びている生物群であるだけに、時宜を得た出版というべきである。なおこの出版物は、京都大学瀬戸臨海実験所の刊行物 Publications of the Seto Marine Biological Laboratory, Special Publication Series の第 5 巻 (Feb. 25, 1981) を構成するものである。分類群は動物命名規約によって記載されているが、植物として扱う場合は藻類であるので植物命名規約 45 条 4 項が適用され、分類群の名に関しては正当な出版物となる。

(千原光雄)