Variability in six major characteristics of 12 annual medic species

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Only five annual medic (Medicago spp.) have cultivars that have made a significant contribution in farming systems in southern Australia. This paper summarises the variability in 7063 accessions of species currently regarded as the most promising for future cultivar development.

Method

Twenty-five seedlings of accessions of predetermined species were planted in the field at Parafield Plant Introduction Centre during the period 1968-82. They were compared with the commercially available cultivar appropriate to each species; M. truncatula cv. Jemalong being used as the control for all non-commercialised species.

Results and Discussion

The five commercialised species were represented by 3799 accessions. Table I illustrates the potential for the development of more vigorous, early flowering and high seed yielding cultivars. The outstanding range of variability within M. intertexta, M. polymorpha, M. tornata and M. truncatula accessions augurs well for future cultivar development. The relatively low seed production of the late flowering species M. murex, M. rigidula and M. turbinata reduces their potential. The large range in levels of hard seededness in M. polymorpha, a very widespread naturalised species in southern Australia is significant as local ecotypes regenerate spasmodically. Excluding the spineless podded species and the short spiced M. turbinata, there is a big range in levels of pod spininess; species such as M. aculeata, M. littoralis, M. murex, M. polymerpha, M. rigidula, M. tornata and M. truncatula all having spineless accessions.

Table 1 - Variability in six characteristics of 12 annual Medicago species at Parafield, South Australia, 1968-82.

	No. Accessions	Seedling vigour	Days to Flowering	Winter Production	Pod Spininess	Seed Grms/Plant	Percent Hard Seeds
M. aculeata	362	4-15	60-130	3-25	0-19	2.1-39.2	46.8-100.0
M. intertexta	272	4-24	80-150	4-30	4-20	0.5-72.2	26.4-99.4
M. littoralis	753	1-17	63-152	1-13	0-20	0.3-35.9	22.6-100.0
M. murex	130	5-14	101-148	5-22	0-19	0.9-21.8	47.0-98.7
M. orbicularis	804	1-14	75-172	2-22	0	0.1-73.4	51.6-100.0
M. polymorpha	1004	2-12	61-183	4-58	0-20	1.2-88.9	0.0-100.0
M. rigidula	562	3-12	90-154	1-12	0-19	0.1-33.1	58.6-100.0
M. rugosa	113	5-13	62-136	7-21	0	0.7-33.6	0.0-100.0
M. scutellata	167	2-12	68-139	4-16	0	3.6-32.0	47.3-100.0
M. tornata	265	4-20	68-157	1-32	0-14	0.8-68.4	23.7-100.0
M. truncatula	2501	2-15	62-151	1-30	0-20	0.4-68.2	20.4-100.0
M. turbinata	130	4-13	74-159	6-18	0-12	1.5-25.2	66.2-100.0
CULTIVARS							
M.littoralis cv.Harbinger	10		91-104	10	3	2.9-25.8	84.5-98.6
M. rugosa cv. Paragosa	10		94-116	10	0	2.2-29.1	0.0-78.0
M.scutellata cv.Robinson	10		76-110	10	0	3.7-34.8	54.6-97.6
M.tornata cv.Tornafield	10		103-124	10	0	2.3-42.5	54.2-95.0
M.truncatula cv.Jemalong	10		102-119	10	10	4.0-29.6	80.7-99.0

N.B. Seedling vigour and winter production assessments of the cultivars are not comparable and apply only to their respective species.

These desirable characteristics can be combined with insect pest and disease resistance in breeding and developing new synthetic hybrids in the future.