

Proposed plant host test list for assessing risk of biological control agents for *Vachellia nilotica* subsp. *indica*

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Background

The following proposed plant list for testing potential biological control agents of *Vachellia nilotica* ssp. *indica* (Benth.) Kyal. & Boatwr. (prickly acacia) was developed by Di Taylor. It is based on currently accepted phylogenetic information available in the literature, following the modernisation of the centrifugal-phylogenetic method (Taylor & Dhileepan, 2019). Once a member of *Acacia*, prickly acacia is now part of the genus *Vachellia* and is now considered to be more closely related to species within the former – Mimoseae tribe than members of the *Acacia* genus (Taylor & Dhileepan, 2019).

Prickly acacia belongs to the family Fabaceae within the order Fabales, a basal angiosperm order. *Vachellia nilotica* (L.) P.J.H.Hurter & Mabb. is a widespread species found in the dry areas of Africa and the Indian subcontinent which has nine subspecies recognised (Brenan, 1983). Molecular study has suggested that the populations within Australia are subspecies *indica* (Wardill et al., 2005). There are 11 *Vachellia* species found in Australia of which nine are native. All occur in Northern Australia. Molecular work suggested that *Vachellia* is nested within the old Mimoseae and is sister to *Neptunia* Lour.

Acacia sensu lato has been split into seven genera (*Acacia* Martius, *Vachellia* Wight & Arn., *Senegalia* Raf., *Parasenegalia* Seigler & Ebinger, *Pseudosenegalia* Seigler & Ebinger, *Acaciella* Britton & Rose and *Mariosousa* Seigler & Ebinger; Miller, Terra, Riggins, Ebinger, & Seigler, 2017). Species within *Acacia* subg. *Acacia* (including prickly acacia) have been transferred to the genus *Vachellia* Wight & Arn. Species within subgenus *Aculeiferum* have been transferred to *Senegalia*, *Acaciella*, *Parasenegalia*, *Pseudosenegalia* and *Mariosousa* (Miller, Terra, Riggins, Ebinger, & Seigler, 2017). Species within *Acacia* subg. *Phyllodineae* (the majority of Australian *Acacia* species) remain in the *Acacia* (*sensu stricto*) genus. *Acacia* (*s.s.*) is well removed from *Vachellia*, though it still remains as a significant part of the proposed test list. There are more than 1000 of native *Acacia* species in Australia (Maslin, 2018).

Further information can found in the attached paper (Taylor & Dhileepan, 2019). Any suggestions for species substitutions or additions are welcomed but we kindly ask that they be justified with the phylogenetic framework approach used to develop the plant host test list. Feedback and comments on this proposed host test list can be addressed to Dr Boyang Shi

(Boyang.Shi@daf.qld.gov.au), Di Taylor (Di.Taylor@daf.qld.gov.au), or Dr K. Dhilepan (Kunjithapatham.Dhilepan@daf.qld.gov.au).

Proposed plant host test list

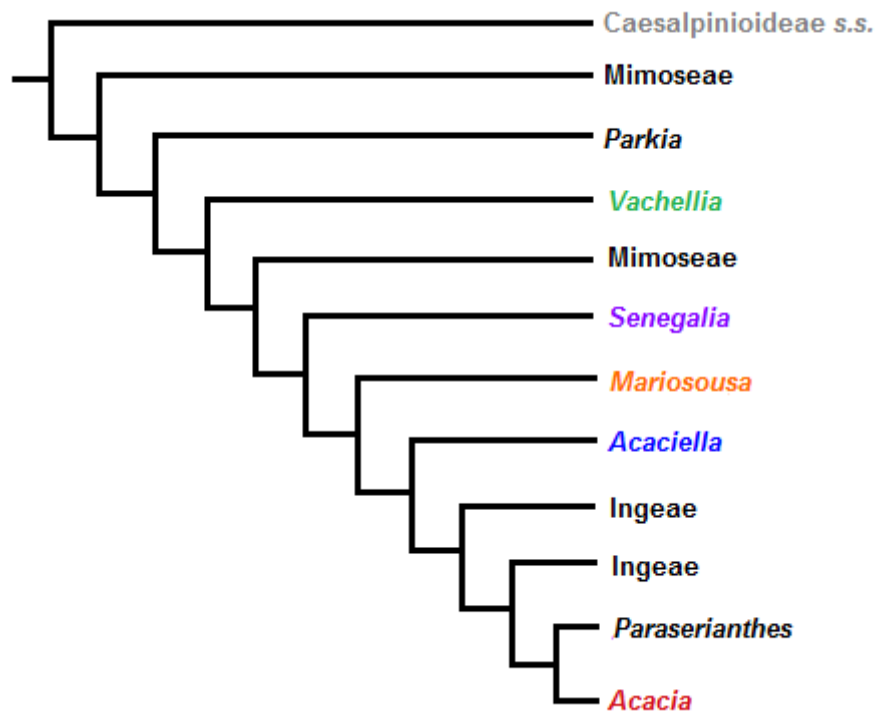
Table 1: List of proposed plant species to be involved in risk assessment of potential biological control for the target weed *Vachellia nilotica* ssp. *indica*. Status: TW = target weed, N = native, I = invasive, O = ornamental, C = crop, E = exotic, non-invasive.

Species	Status	Degree of phylogenetic separation
Order Fabales		
Family Fabaceae Lindl.		
Subfamily Caesalpinioideae DC		
Mimosoid clade (= Mimosoideae de Candolle)		
Genus <i>Vachellia</i>		
<i>V. nilotica</i> ssp. <i>indica</i> (Benth.) Kyal. & Boatwr	TW	0
<i>V. bidwillii</i> (Benth.) Kodela	N	0
<i>V. ditricha</i> (Pedley) Kodela	N	0
<i>V. farnesiana</i> (L.) Wight & Arn.	I	0
<i>V. sutherlandii</i> (F.Muell.) Kodela	N	0
<i>V. valida</i> (Tindale & Kodela) Kodela	N	0
Basal 'Mimoseae'		
<i>Dichrostachys spicata</i> (F.Muell.) Domin	N	1
<i>Leucaena leucocephala</i> (Lam.) de Wit	I	1
<i>Neptunia dimorphantha</i> Domin	N	1
<i>N. monosperma</i> F.Muell. ex Benth.	N	1
Derived 'Mimoseae'		
<i>Adenanthera abrosperma</i> F.Muell.	N	2
<i>Entada phaseoloides</i> (L.) Merr.	N	2
Genus <i>Senegalia</i>		
<i>Senegalia</i> sp. (<i>pennata</i>)	E	3
<i>Senegalia senegal</i>	E	3
'Ingeae'		
<i>Albizia lebbbeck</i> (L.) Benth	N	4
<i>Parachidendron pruinosum</i> (Benth.) I.C.Nielsen	N	4
Genus <i>Acacia</i>		
Section <i>Botrycephalae</i>		
<i>A. baileyana</i> F.Muell.	N	5
<i>A. cardiophylla</i> A.Cunn. ex Benth.	N	5
<i>A. chinchillensis</i> Tindale	N	5
<i>A. deanei</i> subsp. <i>deanei</i> (R.T.Baker) M.B.Welch, Coombs & McGlynn	N	5
<i>A. glaucocarpa</i> Maiden & Blakely.	N	5
<i>A. irrorata</i> Sieber ex Spreng.	N	5
<i>A. oshanesii</i> F.Muell. & Maiden	N	5
<i>A. spectabilis</i> A.Cunn. ex Benth.	N	5
Section <i>Juliflorae</i>		
<i>A. aneura</i> F.Muell. ex Benth.	N	5
<i>A. cambagei</i> R.T.Baker	N	5

<i>A. chisholmii</i> F.M.Bailey	N	5
<i>A. holosericea</i> A.Cunn. ex G.Don	N	5
<i>A. shirleyi</i> Maiden	N	5
Section <i>Lycopodiifoliae</i>		
<i>A. spondyllophylla</i> F.Muell.	N	5
Section <i>Phyllodineae</i>		
<i>A. conferta</i> A.Cunn. ex Benth.	N	5
<i>A. falcata</i> Willd.	N	5
<i>A. podalyriifolia</i> A.Cunn. ex G.Don	N	5
<i>A. salicina</i> Lindl.	N	5
<i>A. victoriae</i> Benth.	N	5
Section <i>Plurinerves</i>		
<i>A. complanata</i> A.Cunn. ex Benth.	N	5
<i>A. coriacea</i> DC.	N	5
<i>A. excelsa</i> Benth.	N	5
<i>A. simsii</i> A.Cunn. ex Benth.	N	5
<i>A. stenophylla</i> A.Cunn. ex Benth.	N	5
Section <i>Pulchellae</i>		
<i>A. drummondii</i> Lindl.	N	5
<i>A. pulchella</i> R.Br.	N	5
<i>Peltophorum</i> clade		
<i>Delonix regia</i> (Boj. ex Hook.) Raf.	OI	6
Cassieae clade		
<i>Senna artemisioides</i> subsp. <i>helmsii</i> (Symon) Randell/ subsp. <i>oligophylla</i> (F.Muell.) Randell	N	7
Subfamily <i>Faboideae</i> Rudd		
<i>Hardenbergia violacea</i> (Schneev.) Stearn	N	8
A crop species (e.g. <i>Phaseolus</i> sp., <i>Cajanus cajan</i> (L.) Millsp.	C	8
Subfamily <i>Dialioideae</i> LPWG		
<i>Petalostylis labicheoides</i> R.Br.	N	9
Subfamily <i>Cercidoideae</i> LPWG		
<i>Bauhinia hookeri</i> F.Muell.	N	10

Appendix 1:

Schematic representation of relationships within the former Mimosoideae with *Acacia s.l.* highlighted in coloured text (Kleinjan and Hoffman 2013; LPWG 2013).



Appendix 2:

Taylor and Dhileepan, 2019 paper.

Taylor, D. B. J., & Dhileepan, K. (2019). Implications of the changing phylogenetic relationships of *Acacia s.l.* on the biological control of *Vachellia nilotica* ssp. *indica* in Australia. *Annals of Applied Biology*, 174(2), 238-247.

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