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1) The genus *Glycine* subgenus *Glycine* germplasm collection.

The genus *Glycine* as currently delimited is divided into two subgenera *Glycine* and *Soja*. The subgenus *Soja* includes the soybean, *G. max*, and its annual wild counterpart, *G. soja*. The subgenus *Glycine* comprises seven wild perennial species. The collection of wild perennial *Glycine* species held at the University of Illinois stands at 288 accessions; a program of morphological, biochemical, and cytogenetic analysis currently is in progress. Voucher specimens of all accessions are deposited in the herbarium of the Crop Evolution Laboratory (CEL), University of Illinois at Urbana-Champaign.

Species	No. of accessions	2n	Country
G. canescens	35(27)[a]	40	A[b](NT,V,NSW,SA,WA)[c]
G. clandestina	54(49)	40	A(ACT,NSW,Q,SA,V,T)
G. falcata	4(3)	40	A(Q)
G. latifolia	10(10)	40	A(Q,NSW,UN)
G. latrobeana	6(1)	40	A(V)
G. tabacina	87(64)	40,80	A(NSW,A,ACT),TA,UN RI,F,NC,TO,VA,MI
G. tomentella	88(44)	38,40,78,80	A(NSW,NT,Q),TA,P,PNG
Unknown	4		

[a]Number of accessions (cytology completed).

[b]Country abbreviations: A = Australia, F = Fiji, MI = Mariana Islands, NC = New Caledonia, P = Philippines, PNG = Papua New Guinea, RI = Ryukyu Islands, TA = Taiwan, TO = Tonga, UN = Unknown, and VA = Vanuatu.

[c](Regions within Australia): ACT = Australian Capital Territory; NSW = New South Wales; NT = Northern Territory; Q = Queensland; SA = South Australia, T = Tasmania; UN = Unknown; V = Victoria; and WA = Western Australia.

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2) Hybridization in genus *Glycine* subgenus *Glycine*.

Since the publication of Newell and Hymowitz (1983), we have obtained a considerable number of new intra- and interspecific hybrids in subgenus *Glycine*. Parents in the hybridization programs were selected based upon their differences in morphology, chromosome number, and the area of origin. These hybrids shown below are being studied cytogenetically.

Table 1. Intraspecific hybrids

Female			Male			Female			Male		
Species	2n	Origin[b]	Species	2n	Origin	Species	2n	Origin	Species	2n	Origin
CAN[a]	40	SA	CAN	40	NSW	CLA	40	NSW	CLA	40	Q
CAN	40	NSW	CAN	40	SA	LAT	40	UN	LAT	40	Q
TAB	40	NSW	TAB	40	NSW	TAB	80	NC	TAB	80	NSW
TAB	80	RI	TAB	80	MI	TAB	80	NSW	TAB	80	NC
TAB	80	MI	TAB	80	RI	TAB	80	MI	TAB	80	NSW
TAB	80	NSW	TAB	80	ACT	TAB	80	NSW	TAB	80	MI
TAB	80	NSW	TAB	80	RI	TAB	80	NSW	TAB	80	TO
TAB	80	NSW	TAB	80	VA	TAB	80	ACT	TAB	80	Q
TAB	80	ACT	TAB	80	NSW	TAB	80	RI	TAB	80	NSW
TAB	80	RI	TAB	80	VA	TAB	80	TO	TAB	80	NSW
TAB	80	TO	TAB	80	NC	TAB	80	TO	TAB	80	RI
TAB	80	VA	TAB	80	NSW	TAB	80	VA	TAB	80	NC
TOM	80	Q	TOM	80	Q	TOM	78	Q	TOM	80	TA
TOM	80	TA	TOM	78	Q	TOM	80	Q	TOM	80	TA
TOM	40	PNG	TOM	78	Q	TOM	80	Q	TOM	78	NSW
TOM	80	TA	TOM	78	NSW	TOM	40	Q	TOM	80	Q

Table 2. Interspecific hybrids

A. Two-way hybrids

Female			Male			Female			Male		
Species	2n	Origin	Species	2n	Origin	Species	2n	Origin	Species	2n	Origin
CAN	40	NSW	TOM	78	NSW	CAN	40	NSW	TOM	80	Q
CLA	40	ACT	LAT	40	UN	CLA	40	ACT	TAB	40	NSW
CLA	40	NSW	TAB	80	NSW	CLA	40	ACT	TOM	80	Q
LAT	40	UN	CAN	40	SA	LAT	40	UN	CAN	40	NSW
LAT	40	Q	CLA	40	Q	LAT	40	NSW	CLA	40	NSW
LAT	40	UN	TAB	40	NSW	LAT	40	UN	TAB	80	NC
LAT	40	UN	TOM	40	PNG	LAT	40	UN	TOM	80	Q
LAT	40	UN	TOM	80	TA						
TAB	40	NSW	CAN	40	NSW	TAB	80	T	CAN	40	NSW
TOM	40	Q	CAN	40	V	TOM	40	Q	CLA	40	NSW
TOM	80	Q	CAN	40	SA						

Continued . . .

Table 2. *Continued*

B. Three-way hybrids

1. [CAN ($2n$ = 40) NSW] x [TAB ($2n$ = 80) NC x TAB ($2n$ = 80) NSW]
2. [CLA ($2n$ = 40) NSW x CAN ($2n$ = 40) NSW] x [LAT ($2n$ = 40) Q]
3. [LAT ($2n$ = 40) NSW x CLA ($2n$ = 40) Q] $F_1 \overset{CT}{=}$ $2n$ = 80 x [TOM ($2n$ = 78) NSW]
4. [LAT ($2n$ = 40) NSW x CLA ($2n$ = 40) Q] $F_1 \overset{CT}{=}$ $2n$ = 80 x [TAB ($2n$ = 80) NSW]
5. [LAT ($2n$ = 40) NSW x CLA ($2n$ = 40) Q] $F_1 \overset{CT}{=}$ $2n$ = 80 x [TAB ($2n$ = 80) TA]
6. [LAT ($2n$ = 40) NSW x CLA ($2n$ = 40) Q] $F_1 \overset{CT}{=}$ $2n$ = 80 x [TAB ($2n$ = 80) VA]
7. [LAT ($2n$ = 40) NSW x CLA ($2n$ = 40) Q] $F_1 \overset{CT}{=}$ $2n$ = 80 x [TAB ($2n$ = 80) NC]

C. Four-way hybrids

[LAT ($2n$ = 40) NSW x CLA ($2n$ = 40) Q] $F_1 \overset{CT}{=}$ $2n$ = 80 x [TAB ($2n$ = 80) NC x TAB ($2n$ = 80) NSW]

[a]Species abbreviations: CAN = *canescens*, CLA = *clandestina*, LAT = *latifolia*, TAB = *tabacina*, and TOM = *tomentella*.

[b]For country or region code, see previous article.

Reference

Newell, C. A. and T. Hymowitz. 1983. Hybridization in the genus *Glycine* subgenus *Glycine* Willd. (Leguminosae, Papilionoideae). Am. J. Bot. 70:334-348.

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3) A soybean x *Glycine tomentella* hybrid: Progress and problems.

Newell and Hymowitz (1982) reported successful hybridization between the soybean (cv 'Altona') ($2n = 40$) and a wild perennial relative *Glycine tomentella* (IL 428) ($2n = 78$). The F_1 plant was completely sterile ($2n = 3x = 59$). A graft of the F_1 plant was made on to the cv 'Williams'. The chromosome number of the grafted plant was doubled ($2n = 6x = 118$) by treatment with 0.1% colchicine. The F_1 colchicine-treated plant produced two pods containing three seeds. One seed germinated to produce an F_2 plant ($2n = 6x = 118$). In 1983, we attempted to backcross several soybean cultivars to this plant. The results are shown below.

Female	Male	No. of flowers	Seed set
F_2 Altona x IL 428 ($2n$=118)	Altona	131	0
F_2 Altona x IL 428 ($2n$=118)	Clark 63	86	0
F_2 Altona x IL 428 ($2n$=118)	Essex	425	0
F_2 Altona x IL 428 ($2n$=118)	Williams	186	0
F_2 Altona x IL 428 ($2n$=118)	Wye	170	0
		998	0

We were not successful in obtaining backcross progeny. However, the F_2 plant produced two pods containing two seeds each. The F_3 seeds will be germinated in April, 1984, and during the summer of 1984 attempts will be made to backcross soybean cultivars to the F_3 plant.

Reference

Newell, C. A. and T. Hymowitz. 1982. Successful wide hybridization between the soybean and a wild perennial relative, *G. tomentella* Hayata. Crop Sci. 22:1062-1065.

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