New species, pollinator interactions and pharmaceutical potential of Himalayan orchids

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Material used in the molecular phylogenetic analyses carried out in Chapter 2. Herbaria where the vouchers were deposited are indicated between brackets.

Origin	NCBI GenBank accession	
	nrITS	matK
Unknown	AF302757	AF302722
Unknown	AF302743	AF302708
Unknown	AF302744	AF302709
Unknown	AF302745	AF302710
Nepal, Siklis	HQ130495	HQ130488
Unknown	HQ130496	HQ130489
India, Meghalaya	HQ130497	HQ130490
India, Kalimpong	HQ130498	HQ130491
Unknown	HQ130499	HQ130492
Unknown	AF302735	AF302700
Nepal, Pokhara	-	HQ130493
Bhutan	HQ130500	HQ130494
China	EU592035	AF448866
Unknown	AF302738	AF302703
India	AF461469	AF503738
Nepal	AF461495	AF503739
Unknown	AF461493	AF503741
Unknown	AF461491	AF503742
Nepal	AY008466	AF263684

	Characters and character states							
Taxa	01	02	03	04	05	06	07	08
Thunia alba	0	0	?	?	?	?	0	0
Pleione hookeriana	0	1	0	0	0	0	0	1
P. humilis	0	1	0	0	0	0	0	1
P. maculata	0	1	0	0	0	0	0	1
P. praecox	0	1	0	0	0	1	0	1
Neogyna gardneriana	1	1	1	1	0	0	0	0
Otochilus albus	1	1	1	1	0	0	0	0
O. lancilabius	1	1	1	1	0	1	0	0
Pholidota articulata	1	1	1	1	0	0	0	0
Ph. imbricata	1	1	1	0	0	0	1	0
Coelogyne flaccida	1	1	1	1	0	1	1	0
C. trinervis	1	1	1	1	0	1	1	0
C. fimbriata	1	1	1	1	1	1	0	0
C. stricta	1	1	1	1	1	1	1	0
C. corymbosa	1	1	1	1	0	0	1	1
C. nitida	1	1	1	1	0	1	0	1
C. occultata	1	1	1	0	1	0	1	0/1
C. punctulata	1	1	1	0	0	0	0	0

Matrix of character states used for optimisation of morphology on molecular phylogeny presented in Chapter 2 (character states are explained in Appendix III).

09	10	11	12	13	14	15	16	17	18	19	20
1	1	3	1	1	2	0	4	0	1	0	1
1	0	2	1	1	2	0	4	0	1	2	1
1	0	2	1	1	2	0	4	3	1	2	1
1	0	2	1	1	2	0	4	0	1	2	1
1	0	1/2	1	1	2	0	4	0	1	2	1
1	1	3	1	1	2	0	4	0	1	2	1
1	0	2	1	1	2	0	2	1	0	1	1
1	0	2	1	1	2	0	2	0	0	1	1
1	0	2	1	1	2	0	1	0	0	2	1
?	1	2	1	1	2	0	2	0	0	2	1
1	0	0	1	1	2	0	2	0	0	0	1
1	0	0	1	1	2	0	2	0	0	0	0
1	0	2	1	1	0	0	3	0	2	1	1
0	0	3	1	1	1/2	0	0	1	1	0	1
1	0	1	1	1	0	1	1/2	0	0	0/1	1
1	0	1/2	1	1	1	1	1	1/2	0	0	1
1	0	2	0	1	1	1	0	2	0	0	1
0	0	3	0	1	1	1	0	2	0	0	1

Morphological characters and character states used for character optimization carried out in Chapter 2.

01. **Rhizome**: 0=absent; 1=present.

02. **Pseudobulbs**: 0=absent; 1=present.

03. **Pseudobulbs lifetime**: 0=less than one year; 1=more than one year.

04. **Pseudobulbs shape**: 0=obovoid; 1=ellipsoid.

05. **Pseudobulbs distance**: 0=clustered; 1=distinctly apart.

06. **Pseudobulbs number of leaves**: 0=1; 1=2.

07. **Leaves:** 0=membraneous; 1=coriaceous.

08. **Peduncle:** 0=not elongating after anthesis; 1=elongating after anthesis.

09. **Lowermost bract of rhachis**: 0=sterile; 1=fertile.

10. **Floral bracts**: 0=caducous; 1=persistent.

11. **Inflorescence:** 0=heteranthous; 1=proteranthous; 2=synanthous; 3=hysteranthous.

12. **Lip size**: 0=much shorter as sepals and petals; 1=just as long as sepals and petals.

13. **Hypochile lateral lobes**: 0=extending more than 1 cm beyond sinusl; 1=extending less than 1 cm beyond sinus.

14. **Lip lateral lobes**: 0=with crenulate or crisped margin; 1=with erose or denticulate margin; 2=with entire margin.

15. **Lip lateral lobes ornamentation**: 0=eye--shaped patch absent; 1= eye--shaped patch present.

16. **Lip lateral keels:** 0=clavate; 1=rod--shaped; 2=linear to crenulate; 3=plate--like; 4=fimbriate.

17. **Lip midlobe ornamentation**: 0=existing of 0 colour patches; 1=existing of 1 colour patch; 2=existing of 2 colour patches; 3=existing of many colour patches .

18. **Lip midlobe margin**: 0=entire to erose; 1=crenulate to cristate; 2=lamellate.

19. **Lip midlobe tip:** 0=acute; 1=cuspidate; 2=emarginate.

20. **Fruit**: 0=triangular in cross section; 1=circular in cross section.

Overview of macromorphological characters scored from herbarium and living material and literature of species of *Panisea* examined in Chapter 3.

Characters:
1=pseudobulb shape (0=ovoid/1=oblong-cylindric);
2=leaf length (0=<3 cm/1=>4 cm);
3=inflorescence type (0=heteranthous/1=hysteranthous/2=proteranthous/3=synanthous);
4= flower number (0=<2/1=>3);
5=rhachis shape (0=not distichous/1=distichous);
6=keels on sepals (0=absent/1=present);
7=keels on lip (0=absent/1=present);
8=keels position on lip (0= born on mesochile only/1=born on epichile only/3=born on both mesochile and epichile);
9=lip length (0=as long as column/1=twice as long as column);
10=lip (0=without any lobes /1=distinctly three lobed);
11=length of lateral lobes of hypochilum lip (0=<0.2 cm/1=>0.3cm);
12=lip with distinct sinus (0=absent/1=present);
13=shape of mid-lobe of lip (0=orbicular/1=obovate/2=elliptic);
14=margin of mid-lobe of lip (0=entire/1=undulate/2=crenate);
15=tip of mid-lobe of lip (0=entire/1=acute/2=mucronate/3=apiculate);
16=column stelidia (0=absent/1=present)

Taxon	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
P. albiflora	0	1	3	1	1	0	1	0	1	0	0	0	1	0	1	0
P. apiculata	0	1	0	0	0	0	1	0	0	1	0	0	0	0	3	0
P. demissa	0	1	0	1	1	1	0	0	0	0	0	0	2	1	1	0
P. distelidia	0	1	2	0	0	0	1	2	1	1	1	0	0	2	2	1
P. panchaseensis	0	0	0	1	0	0	1	0	1	0	0	0	2	1	1	0
P. tricallosa	1	1	0	0	0	0	1	2	1	0	0	0	1	0	2	0
P. uniflora	0	1	2	0	0	1	1	1	1	1	0	0	1	2	0	0
P. vinhii	0	1	1	1	0	1	1	1	1	1	1	1	2	1	1	0
P. yunnanensis	0	1	0	0	0	0	0	0	1	0	0	0	1	0	2	0
P. zeylanica	0	1	2	0	0	0	1	0	1	1	1	1	0	2	1	0