

# An analysis on the distribution of the Indian taxa of the genus *Primula* Linn., in the eastern Himalaya with remarks on the species of Assam

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## A B S T R A C T

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In the present communication, 99 species, 4 sub-species and 10 varieties are recorded in the Eastern Himalaya totalling the number of taxa as 113. The table appended shows the names of taxa with original citation, synonyms where necessary and their occurrence in the specified areas of the Eastern Himalaya thereby indicating Indian elements. 14 taxa are recorded for the first time in the respective State.

## I N T R O D U C T I O N

The genus *Primula* Linn. was first treated taxonomically by LEHMANN (1817) followed by DUBY (1844). In India, 43 species were recorded by HOOKER (1882) of which 35 belongs to the Eastern India, mainly confined to Sikkim, Bhutan and Khasia Hills (Assam). KING (1887) reported three Himalayan Primulas. PAX and KUNTH (1905) published a monograph of the family *Primulaceae* in Engler's *Das Pflanzenreich*. WATT (1882, 1904-1905, 1913-1914) has largely studied the Indian Primulas. Of the later works on Himalayan Primulas, mention may be made of BALFOUR (1915, 1916), CRAIB (1913), FORREST (1923), SMITH and FORREST (1927, 1928), SMITH (1931, 1936-1938), WARD (1930), SMITH and WARD (1926, 1927), COOPER (1933), SMITH and FLETCHER (1941-1944, 1946, 1948, 1949), LUDLOW (1951), FLETCHER (1952, 1953) and recently of HARA'S (1966) account on the monographs on the taxa made by SMITH and FLETCHER (1941-1949)

family *Primulaceae* in the Sikkim Himalaya. On the basis of the available literature and herbarium in the Central National Herbarium (CAL), the author has intended to compile a synoptic study of the distribution of areas of the species of the genus *Primula* L., in the Eastern Himalaya which appears to be the main abode of the taxa of the genus. The distribution areas of the taxa recorded are Sikkim, Bhutan and Assam excluding Nepal (C. Himalaya), Tibet and Burma with a view to recording Indian taxa of *Primula* L., in Eastern Himalaya. The taxa of Western and N. W. Himalaya excluding Pakistan have not been taken into consideration in the purview of the present discussion.

TABLE 1.—*Distribution areas of the species of Primula L. in the Eastern Himalaya. (+) indicates new record of taxa in the respective State.*

Species	Distribution (E. Himalaya)		
	Sikkim	Bhutan	Assam
<i>P. agleniana</i> Balf. f. et Forrest var. <i>atrocrocca</i> Ward in Ann. Bot. XLIV. 123 (1930) .....			+
<i>P. alpicola</i> var. <i>luna</i> (Stapf.) W. W. Sm. et Fletcher in Trans. Bot. Soc. Edin. XXXIII. Pt. IV. 437 (1943) .....		+	
<i>P. assamica</i> Fletcher in Trans. Bot. Soc. Edin. XXIII, 107 (1941) .			+
<i>P. atrodentata</i> W. W. Sm. in Rec. Bot. Surv. Ind., IV. 217 (1911).	+	+	+
<i>P. aureata</i> Fletcher in Gard. Illus. LXIII, 283, with fig. (1941)....	+	+	
<i>P. barnardoana</i> W. W. Sm. et Ward in Notes Roy. Bot. Gard. Edin. XIX. 167 (1936) .....		+	
<i>P. bellidifolia</i> King ex Hk. f. in Fl. Brit. Ind. III, 486 (1882).....	+	+	
<i>P. bhutanica</i> Fletcher in Gard. Illus. LXIII, 312, fig. p. 310 (1941) and Trans. and Proc. Bot. Soc. Edin. XXXIII, 109 (1941).....		+	(+)
<i>P. blandula</i> W. W. Sm. in Notes Roy. Bot. Gard. Edin. XV. 299 (1927) .....			+
<i>P. boothii</i> Craib in Notes Roy. Bot. Gard. Edin, VI. 249 (1917)...		+	
<i>P. bracteosa</i> Craib in Notes Roy. Bot. Gard. Edin., VI. 250 (1917)	+	+	+
<i>P. calderiana</i> Balf. f. et Cooper in Notes Roy. Bot. Gard. Edin, IX, 7 (1915) .....	+	+	(+)
<i>P. calderiana</i> var. <i>acaulescens</i> (Balf. f. et W. W. Sm.) W. W. Sm. & H. R. Fletcher in Trans. Roy. Soc. Edin. LXI. Pt. II. No. 10. 303 (1944) .....			
= <i>P. roylei</i> var. <i>acaulescens</i> Balf. f. et W. W. Sm. in Notes Roy Bot. Gard. Edin. IX. 200 (1916) .....	+		
<i>P. calderiana</i> var. <i>alba</i> (W. W. Sm.) W. W. Sm. & H. R. Fletcher in Trans. Roy. Soc. Edin. LXI. Pt. II, No. 10, 302 (1944) .....			

TABLE 1. (Continuation).—*Distribution areas of the species of Primula L. in the Eastern Himalaya. (+) indicates new record of taxa in the respective State.*

Species	Distribution (E. Himalaya)		
	Sikkim	Bhutan	Assam
= <i>P. roylei</i> var. <i>alba</i> W. W. Sm. in Notes Roy. Bot. Gard. Edin. XIX. 211 (1937) . . . . .	+	+	
<i>P. calthifolia</i> W. W. Sm. in Notes Roy. Bot. Gard. Edin., XV, 300 (1927) . . . . .			+
<i>P. capitata</i> Hook in Bot. Mag. t. 4550 (1850) . . . . .	+	+	
<i>P. capitata</i> Hook. sub. sp. <i>Craibeana</i> (Balf. f. W. W. Sm.) W. W. Sm. et Forrest in Notes Roy. Bot. Gard. Edin. XVI, 18 (1928) . . . . .	+	+	
= <i>P. craibeana</i> Balf. f. et W. W. Sm. in Notes Roy. Bot. Gard. Edin. IX. 159 (1916) . . . . .			
<i>P. capitata</i> Hook. sub. sp. <i>crispata</i> (Balf. f. et W. W. Sm.) W. W. Sm. et Forrest in Notes Roy Bot. Gard. Edin. XVI, 18 (1928) . . . . .	+	+	
= <i>P. crispata</i> Balf. f. et W. W. Sm. in Notes Roy Bot. Gard. Edin. IX. 162, 185 (1916) . . . . .			
<i>P. capitata</i> Hook. sub. sp. <i>lacteocapitata</i> (Balf. f. et W. W. Sm.) W. W. Sm. et Forrest in Notes Roy. Bot. Gard. Edin. 18 (1928) . . . . .	+		
= <i>P. lacteocapitata</i> Balf. f. et W. W. Sm. in Notes Roy. Bot. Gard. Edin. IX. 178, 185 (1916) . . . . .			
<i>P. capitata</i> sub. sp. <i>mooreana</i> (Balf. f. et W. W. Sm.) W. W. Sm. et Forrest in Notes Roy. Bot. Gard. Edin. XVI. 18 (1828) . . . . .			
= <i>P. mooreana</i> Balf. f. et W. W. Sm. in Notes Roy. Bot. Gard. Edin. IX. 183 (1916) . . . . .	+		
<i>P. caveana</i> W. W. Sm. in Rec. Bot. Surv. India, IV. 218 (1911) . . . . .	+	+	
<i>P. chasmophila</i> Balf. f. ex Hutchinson in Bot. Mag. t. 8791 (1919) . . . . .		+	
<i>P. chungensis</i> Balf. f. et Ward in Notes Roy. Bot. Gard. Edin. XIII, 7 (1920) . . . . .		+	+
<i>P. clutterbuckii</i> Ward in Ann. Bot. XLIV. 122 (1930) . . . . .			+
<i>P. concinna</i> Watt in Jour. Linn. Soc. XX. 5. tab. 4 A (1882) . . . . .	+	+	
<i>P. concholoba</i> Stapf. et Sealy in Bot. Mag. t. 9289 (1932) . . . . .			+
<i>P. cooperi</i> Balf. f. in Notes Roy. Bot. Gard. Edin. IX. 158 (1915) . . . . .	+		
<i>P. cunninghamii</i> King ex Craib in Notes Roy. Bot. Gard. Edin. IV. 250, 264, 268, 273 (1917) . . . . .	+		
<i>P. denticulata</i> W. W. Sm. in Exot. Bot. 11, 109, t. 114 (1805) . . . . .	+	+	+
<i>P. deuteronana</i> Craib in Notes Roy. Bot. Gard. Edin. VI. 251 (1917) . . . . .	+		
<i>P. dickieanna</i> Watt in Journ. Linn. Soc. XX. 9, t. 84 (1882) . . . . .	+	+	
<i>P. dickieanna</i> Watt var. <i>aureostellata</i> (Balf. f. et Cooper) Fletcher in Trans. Bot. Soc. Edin. XXXIII. Pt. iii 218 (1942) . . . . .		+	

TABLE 1. (Continuation).—*Distribution areas of the species of Primula L. in the Eastern Himalaya. (+) indicates new record of taxa in the respective State.*

Species	Distribution (E. Himalaya)		
	Sikkim	Bhutan	Assam
= <i>P. aureostellata</i> Balf. f. et Cooper in Notes Roy Bot. Gard. Edin. IX. 149 (1915) .....			
<i>P. dickieana</i> Watt var <i>gouldii</i> Fletcher in Journ. Linn. Soc. Lii ined. (1942) .....		+	
<i>P. eburnea</i> Balf. f. et Cooper in Notes Roy. Bot. Gard. Edin. IX. p. 166 (1916) .....		+	
<i>P. elongata</i> Wall. in Jour. Linn. Soc. Bot. XX. 8. t. 6 (1882) .....	+	+	
<i>P. emiliae</i> Balf. in Notes Roy. Bot. Gard. Edin. XVIII. 92 (1933) .		+	
<i>P. erosa</i> (Wall. ex Duby) Regel in Bot. Zeitz. 333 (1853) .....		+	
= <i>P. denticulata</i> var. <i>erosa</i> Wall. ex Duby in DC Prodr. VIII. 45 (1844) .....			
<i>P. euosma</i> Craib in Notes Roy. Bot. Gard. Gard. Edin. XI, 172 (1919) .....	+		(+)
<i>P. erythrea</i> Fletcher nom. nov. ....			
= <i>P. rubra</i> in Ann. Bot. XLIV, 124 (1930) .....			+
<i>P. erythrocarpa</i> Craib in Notes Roy. Bot. Gard. Edin. X. 206 (1918) .....		+	
<i>P. filipes</i> Watt in Jour. Linn. Soc. XX. 5 t. 3a (1882) .....			
<i>P. firmipes</i> Balf. f. et Forrest in Notes Roy. Bot. Gard. Edin. XIII, 10 (1920) .....			+
= <i>P. deleiensis</i> Ward in Ann. Bot. XLIV. 124 (1930) .....			
<i>P. flagellaris</i> W. W. Sm. in Rec. Bot. Surv. Ind. IV. 219 (1913) ..	+	+	
<i>P. gambeliana</i> Watt in Jour. Linn. Soc. XX. 3t. 1 (1882) .....	+	+	
<i>P. geraniifolia</i> Hook. f. in Fl. Brit. Ind. III. 484 (1882) .....		+	
<i>P. glabra</i> Klatt in Linnaea, 500 (1872) .....	+	+	(+)
<i>P. glomerata</i> Pax in Engl. Pflanzenr. Primulaceae 92 (1905) .....			
= <i>P. crispa</i> Balf. f. et W. W. Sm. in Notes Roy Bot. Gard. Edin. IX. 160 (1916) .....	+		
<i>P. gracilipes</i> Craib in Notes Roy. Bot. Gard. Edin. VI. 252 (1917) .	+	+	
= <i>P. scullyi</i> Craib in Notes Roy. Bot. Gard. Edin. VI. 274 (1917) ...			
<i>P. griffithii</i> (Watt.) Pax in Engler's Bot. Jahrb X, 213 (1889) .....		+	
= <i>P. obtusifolia</i> var. <i>griffithii</i> Watt. in Journ. Linn. Soc. XX. 8. t.5 (1882) .....			
<i>P. hookeri</i> Watt in Journ. Linn. Soc. XX. 14, t. 813 (1882) .....	+		
<i>P. ianthina</i> Balf. f. et Cave in Notes Roy. Bot. Gard. Edin. IX. 175 (1916) .....	+		
<i>P. indobella</i> Balf. f. et W. W. Sm. in Notes Roy. Bot. Gard. Edin. IX. 24 (1916) .....		+	

TABLE 1. (Continuation).—*Distribution areas of the species of Primula L. in the Eastern Himalaya. (+) indicates new record of taxa in the respective State.*

Species	Distribution (E. Himalaya)		
	Sikkim	Bhutan	Assam
<i>P. irregularis</i> Craib in Notes Roy. Bot. Gard. Edin. VI. 253 (1917)	+		
<i>P. jigmediana</i> W. W. Sm. in Notes Roy Bot. Gard. Edin. XIX. P. 171 (1936)		+	
<i>P. jonarduni</i> W. W. Sm. in Rec. Bot. Surv. Ind. IV. 269 (1911)		+	
= <i>P. orieina</i> Balf. f. et Cooper in Notes. Roy. Bot. Gard. Edin. IX. 189 (1916)			
<i>P. khasiana</i> Balf. f. et W. W. Sm. in Notes Roy. Bot. Gard. Edin. IX. 176 (1915)			
<i>P. kingii</i> Watt in Jour. Linn. Soc. Bot. Soc. 9. t. 8A (1882)	+	+	+
<i>P. laxiuscula</i> W. W. Sm. in Trans. & Proc. Bot. Soc. Edin. 35: 184 (1950)			+
<i>P. listeri</i> King ex Hook. f. in Fl. Brit. Ind. III. 485 (1882)	+	+	+
<i>P. ludlowii</i> W. W. Sm. in Notes Roy. Bot. Gard. Edin. XIX, p. 172 (1936)		+	
<i>P. macrophylla</i> Don, Prodr. Fl. Nepal 80 (1825)	+	+	
<i>P. malacoides</i> Franch. in Bul. Soc. Fr. XXXIII. 64 (1886)			(+)
= <i>P. pseudomalacoides</i> L. B. Stewart in Notes Roy. Bot. Gard. Edin. 36 (1915)			
<i>P. megalocarpa</i> Hara in Jour. Jap. Bot. XLIX. 5. 133 (1974)	+	+	
<i>P. melanodonta</i> W. W. Sm. in Notes Bot. Gard. Edin. XV. 303 (1927)			(+)
<i>P. melichlora</i> Balf. f. et W. W. Sm. in Notes Roy. Bot. Gard. Edin. IX. 29 (1915)	+		
<i>P. menziesiana</i> Balf. f. et W. W. Sm. in Notes Roy. Bot. Gard. Edin. IX. 182 (1916)		+	
<i>P. mishmiensis</i> Ward in Ann. Bot. XLIV. 122, 125 (1930)			+
<i>P. mollis</i> Nutt ex Hook in Bot. Mag. t. 4798 (1854)		+	+
<i>P. munroi</i> Lindl. in Bot. Reg. t. 15 (1833)	+	+	(+)
= <i>P. involucrata</i> Wall. ex Duby in DC. Prodr. VIII. 42 (1844)			
<i>P. muscoides</i> Hook. f. ex Watt in Journ. Linn. Soc. XX. 15 t. 4 D (1882)	+	+	
<i>P. normaniana</i> Ward in Ann. Bot. XLIV. 123 (1930)			+
<i>P. obliqua</i> W. W. Sm. in Trans. Bot. Soc. Edin. XXVI. 154 (1913)	+	+	
<i>P. petiolaris</i> Wall. in Roxb. Fl. Ind. ii. 22 (1824)	+		
<i>P. polonensis</i> Ward in Ann. Bot. XLIV. 124 (1930)			+
<i>P. prenantha</i> Balf. f. et W. W. Sm. in Notes Roy. Bot. Gard. Edin. IX. 191 (1916)	+	+	(+)

TABLE 1. (Continuation).—*Distribution areas of the species of Primula L. in the Eastern Himalaya. (+) indicates new record of taxa in the respective State.*

Species	Distribution (E. Himalaya)		
	Sikkim	Bhutan	Assam
<i>P. primulina</i> (Sprengl.) Hara in Journ. Jap. Bot. 37: 99 (1962) . . . . .	+	+	(+)
= <i>P. pusilla</i> Wall. in Roxb. Fl. Ind. ed. Cavy. 2: 22 (1824) . . . . .			(+)
<i>P. prolifera</i> Wall. in Asiat. Res. XIII. 372. t. 3 (1820) . . . . .			(+)
<i>P. pulchra</i> Watt in Journ. Linn. Soc. XX. 3. t. 2 A (1882) . . . . .	+		
<i>P. reticulata</i> Wall. in Roxb. Fl. Ind. ii. 21 (1824) . . . . .	+	+	
<i>P. rotundifolia</i> Wall. in Roxb. Fl. Ind. (ed. Carey) ii. 18 (1924) . . . . .	+		
<i>P. sapphirina</i> Hook. & Thoms. ex Hook. f. in Fl. Brit. Ind. iii. P. 492 (1882) . . . . .	+	+	
<i>P. scapigera</i> (Hook. f.) Craib in Notes Roy. Bot. Gard. Edin. VI. 254 (1917) . . . . .	+		(+)
= <i>P. petiolaris</i> Wall. var. <i>scapigera</i> Hook f. in Fl. Brit. Ind. III. 494 (1882) . . . . .			
<i>P. septemloba</i> Franch. var. <i>minor</i> Ward in Ann. Bot. XLIV 123 (1930) . . . . .			+
<i>P. sherriffae</i> W. W. Sm. in New Flora & Silva XVIII. P. 130 cummic (1936) . . . . .		+	
<i>P. sikkimensis</i> Hook. in Bot. Mag. t. 4597 (1851) . . . . .	+	+	
<i>P. sikkimensis</i> Hook. var. <i>hopeana</i> (Balf. f. et Cooper) W. W. Sm. et Fletcher in Trans. Sot. Soc. Edin. XXXIII. Pt. IV 453 (1943) . . . . .		+	
= <i>P. hopeana</i> Balf. f. et Cooper in trans. Bot. Soc. Edin. xxvii. 236 (1917) . . . . .			
<i>P. sikkimensis</i> Hook. var. <i>pubibunda</i> (W. W. Sm.) W. W. Sm. & Fletcher in Tans. Bot. Soc. Edin. XXXIII. Pt. IV. 454 (1943) . . . . .	+	+	
= <i>P. pubibunda</i> W. W. Sm. in Rec. Bot. Surv. Ind. VI. 38 (1913) . . . . .			+
<i>P. silaensis</i> Petitm. in Bull. Herb. Boiss., Ser. ii. VII. 524, fig. 3. 111 (1907) . . . . .			+
<i>P. smithiana</i> Craib in Journ. Roy. Harb. Soc. Lond. XXXIX. 190 (1913) . . . . .		+	(+)
<i>P. soldanelloides</i> Watt in Journ. Linn. Soc. Lond. Bot. XX. P. 10. t. 11 C (1882) . . . . .	+	+	
<i>P. spathulifolia</i> (Hk. f.) Craib in Journ. Roy. Hort. Soc. XXXIX. 190 (1913) . . . . .	+		
= <i>P. minutissima</i> Jacq. ex DC. var. <i>spathulata</i> Hk. f. in Fl. Brit. Ind. III. 494 (1882) . . . . .			
<i>P. stirtoniana</i> Watt. in Journ. Linn. Soc. XX. 15 t. p. 15 (1882) . . . . .	+	+	

TABLE 1. (Continuation).—*Distribution areas of the species of Primula L. in the Eastern Himalaya. (+) indicates new record of taxa in the respective State.*

Species	Distribution (E. Himalaya)		
	Sikkim	Bhutan	Assam
<i>P. strumosa</i> Balf. f. et Cooper in Notes Roy. Bot. Gard. Edin. IX. 201-202 (1916).....	+	+	
<i>P. strumosa</i> Balf. f. et Cooper var. <i>perlata</i> W. W. Sm. et Fletcher in Trans. Roy. Soc. Edin. LXI. Pt. II. No. 10. 305-306 (1940) ..		+	
<i>P. stuartii</i> Wall in Roxb. Fl. Ind. ed. Carey II. 20 (1824).....	+		+
<i>P. tanneri</i> King in Journ. As. Soc. Beng. LV. II 227, t. 8 (1886)...	+	+	(+)
<i>P. tenella</i> King ex Hook. f. in Fl. Brit. Ind. III 492 (1882).....	+	+	
<i>P. tenuiloba</i> (Hk. f.) Pax in Engler's Bot. Jahrb. X. 204 (1889) ...	+	+	
= <i>P. muscoides</i> Hk. f. var. <i>tenuiloba</i> Hook. f. in Journ. Linn. Soc. Bot. 20: 15 t. 13 A (1882) .....			
<i>P. tibetica</i> Watt in Journ. Linn. Soc. XX. 6. tab. 11 A (1882).....	+	+	
<i>P. traillii</i> Watt in Jour. Roy. Hort. Soc. Lond. XXIX. 299 (1904) ..	+	+	
<i>P. tsariensis</i> W. W. Sm. in Notes Roy. Bot. Gard. Edin. XIX. 211 (1937) .....		+	
<i>P. umbratilis</i> Balf. f. & Cooper in Notes Roy. Bot. Gard. Edin. XII. 22 (1920) .....		+	
<i>P. umbratilis</i> Balf. f. & Cooper var. <i>alba</i> Fletcher in Journ. Linn. Soc. Lond. 52: 332 (1939-45) .....		+	
<i>P. uniflora</i> Klatt in Linnaea XXXVII, p. 500 (1872) .....	+	+	
<i>P. vaginata</i> Watt in Journ. Linn. Soc. XX. 4 t. 2 B (1882).....	+		
<i>P. vernicosa</i> Ward in Notes Roy. Bot. Gard. Edin. IX. 203 (1916).		+	+
<i>P. waddellii</i> Balf. f. et W. W. Sm. in Notes. Roy. Bot. Gard. Edin. IX. 56-57 (1915).....		+	
<i>P. walsii</i> Craib in Journ. Roy. Hort. Soc. XXXIX. 187, 190 (1913)		+	
<i>P. waltoni</i> Watt ex Balf. f. in Notes Roy. Bot. Gard. Edin. IX. 57-58 (1915) .....	+	+	
<i>P. wattii</i> King ex Watt in Journ. Linn. Soc. Lond. Bot. XX, p. 10, t. 14 A (1882) .....	+	+	(+)
<i>P. whitei</i> W. W. Sm. in Rec. Bot. Surv. Ind. IV. 268 (1911) .....		+	
<i>P. xanthopa</i> Balf. f. et Cooper in Notes. Bot. Gard. Edin. IX. 204-205 (1916).....		+	
<i>P. yargongensis</i> Petitrux in Bull. Herb. Boiss. VIII. 366 (1908)....	+	+	

## DISCUSSION

One critical study and scrutiny of the materials of the genus *Primula* L., based on different Indian herbaria and available literatu-

re, particularly with special reference to serially published monographs on the taxa made by SMITH and FLETCHER (1941-1949) reveals that the Eastern Himalaya is the chief abode of taxa of the genus *Primula* L. excluding Nepal (C. Himalaya) and other adjoining British territories. From the recorded data, it is evident that Sikkim occupies the greatest number of taxa in contrast to other areas of the Eastern Himalaya as recorded in the present table. It is very interesting to note that the taxa of the genus studied are now well spread over the Assam Himalayan region. KANJILAL *et al.* (1940) recorded only 2 species of the genus but the present data reveals the record of 39 taxa from the specified region of which the previously recorded two species of Assam were also recorded by HOOKER (1883). Therefore, the total record of species of *Primula* L. has now been raised to 37 as additions to the Flora of Assam (KANJILAL *et al.*, 1940).

## A C K N O W L E D G E M E N T S

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## R E S U M E N

En este artículo se registran 113 taxa del género *Primula* L., distribuidos en 99 especies, 4 subespecies y 10 variedades presentes en 3 Estados del este del Himalaya (Sikkim, Brithan y Assam). En el cuadro se indican los nombres de los taxa con su referencia original, los sinónimos y su presencia en dichas zonas del este del Himalaya. 14 de los taxa se registran por primera vez en el correspondiente Estado. La nomenclatura de las especies se ha puesto al día lo mejor posible.



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1882 *The Flora of British India*, vol. III, Reeve & Co., London.
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