INTRODUCTION

All planned plant breeding is based on the multitude of forms found in nature or released in experimentation. Natural variation is still the main source of the genes and genotypes needed for the successive improvement of a cultivated species. New variation continually arises by various processes: (1) hybridization, followed by gene recombination; (2) the occurrence of gene mutations and chromosomal changes of various kinds; and (3) the increase or decrease in chromosome number (cf. Gustafsson, 1962).

To improve the quality and yield of the jute crop, two cultivated species of Corchorus, viz., *C. olitorius* and *C. capsularis* of the family Tiliacae were selected for the present study.

Many earlier workers attempted few thousand interspecific crosses and reported incompatibility between *olitorius* and *capsularis*. Due to the prevailing incompatibility barrier in them the scope of production of improved strains has rather become narrow and is only confined to mere selection of the existing limited materials available in each of these species. Therefore, induction of polyploidy, production of mutations and various
studies on them were taken up to further the scope in jute breeding. However, some amount of work on interspecific hybridization was also taken up with polyploidy and mutational studies and proved successful.

The characteristics of the cultivated species of jute:

1. C. ollitorius Linn. - Annual shrub, 5-18 ft. tall; branched or non-branched; small branches in case of branching. Stem glabrous with anthocyanin pigmentation grades-green to light or dark red. Leaf blade 5-20 cm. x 3.5-9 cm., ovate-lanceolate, acute or acuminate, glabrous or rough, coarsely serrate; basal serratures often prolonged into tail-like appendages more and hairy appendages longer, base round 5-nerved; petiole 4-9 cm. long, green to pink; stipules subulate, tip coloured or green, base coloured sometimes, 0.5 to 1.5 cm. or more long. Flowers 6-10 mm. in length, 10-15 mm. in diam. bigger, yellow to pale yellow, generally in extra-axillary leaf-opposed condensed cyme on the terminal and the lateral branches in groups of 2-3, sometimes 5; peduncles ± 2 mm. long; pedicels stout, 3-4 mm. long. Sepals 5-8 mm. long, 2-3 mm. broad, oblong, apiculate, i.e. tips prolonged in flower buds, 5 or 6, green, valvate, petals 5-8, yellow or pale yellow, imbricate, entire or split. Stamens 30-60. Anthers yellow ± globose. Ovary syncarpous, linear-oblong, 5- rarely 6-carpeled, Style very variable, constricted from the broader ovary and forming the beak in fruit. Stigma globular, entire, pubescent. Capsule 60-74 mm. long x 4-6 mm. broad, cylindric, linear glabrous, surface ornamented
by symmetrical wavy undulations, 10-ribbed, beaked, tips of dehiscing valves hooked, 6-valved, valves with transverse partitions between the seeds. Ovules anatropous, 97-211 per ovary, in each loculus with single row; axile placentation. Seeds smaller trigonous, wedge-shaped, ± 2 mm. in length, base ± 1.2 mm. broad, smooth, uneven, bluish green to steel gray (or even dull black). About 500 per gramme.

Plants non-bitter. Flowers bloom earlier and remain so for about 7 hours.

Rather much tanin present in plants; hence chance of getting coloured fibres - steel black or shyamla after retting.

Ultimate fibres longer; fibre bundles larger, number of fibres more. Fibres with a reddish or grayish tinge, finer, softer, stronger and lustrous with superior spinning quality. Periderm formation less prominent; lenticel development in later stages. Wood showing greater number of pores, mostly occurring in groups of 2 or 3 or rarely more; more wood formation and the cell walls of wood elements more thickened; so tough wood and hence less liable to lodging. Pith collapses earlier.

Initiation and range of flowering prolonged over a longer period (about ten weeks) with periodic flushes. Distribution and growth of fibres more even along the stem; so the stem cylindrical. Life cycle 3½ to 6 months depending on the type as well as the time of sowing. Flowers prematurely, if sown early. Yields a little more. Takes a little more time for retting with the same base diameter and plant height than *capsularis*.

Natural cross-pollination - 13 per cent.

Highly resistant to anthracnose and chlorosis; susceptible to the pest *Nupserha bicolor* THOMS. s. sp. *nugtenorrae* BRENUN.

2. *C. capsularis* LINN. - Annual shrub, 5-14 ft. tall. Stem glabrous with anthocyanin pigmentation grades-green to dull coppery red to pink. Branched or non-branched; with long branches in branching types. Leaf blade 4-15 cm. x 2.0-9.6 cm. broad, ovate-lanceolate or linear-lanceolate, acute or acuminate, coarsely serrate, basal serratures usually prolonged into tail-like appendages; petiole 4-8 cm. long, slender, green-dark-red; stipule filiform-foliaceous, 0.5 to 2 cm. or more; tip coloured sometimes, base coloured or green. Flowers smaller, 2 to 6 mm. in length and 4.5 to 8 mm. in breadth, arranged in short or condensed extra-axillary leaf-opposed cymes; flowers in groups of 2-6 or even 10; peduncles 2-3 mm. long, 1.5-2 mm. broad, ovate-linear, entire, acuminate; Sepals coloured or green 3-4 mm. long. Petals 5, yellow or pale yellowish ovate, acuminate. Stamens 20-30 ± 3 mm. long; anthers yellow or pale yellow, globose. Ovary syncarpous pentalocular. Ovules anatropous, 25-50 per ovary, two rows in each loculus.
Placentation axile. Style variable in length. Stigma 2-3 fid. Capsule 7-11 mm. long, 5-11 mm. in diameter, subglobose, ridged and muricated, 5-valved, depressed at the organic apex or oval-podded. Valves woody without transverse septa. Seeds ± 2 mm. long 1-1.5 mm. broad, wedge-shaped uneven, smooth, chocolate-brown. About 300 per gramme.

Plants usually bitter, non-bitter in a few cases. Flowers bloom later and remain so for about 6 hours.

Less tannin content.

Ultimate fibre comparatively smaller, less in number. Fibres whitish and rough with inferior spinning quality. Excessive development of periderm formation in later stages in basal portions. Wood shows less pronounced growth zones, comparatively less thickened cell walls of different wood elements, more diffused pores, lesser number of pores, vessels usually occurring singly; wood fibres and large number of less thickened fibre-tracheids; so wood softer and liable to lodging. Pith persists.

Root system superficial and spreading; penetrates the soil 10-12 inches deep; secondary roots not well-developed. Resistant to water-logging; hence best performance in clay and low-lying areas, though it can as well grow on high lands. More resistant to salinity. Can withstand drought in early stages.

Leaf output more and foliage retained on the stem for a longer period.

Initiation and range of flowering optimum over a shorter period of 4-6 weeks. Distribution and growth of fibres more
concentrated in the lower portions of the stem, which is thus
conical. Life cycle 4-6 months' period according to the type
as well as the time of sowing. Yield little less. Takes less
time for retting with the same base diameter and plant height
than *piitordus*.

Natural cross-pollination - 2.5 per cent.

Susceptible to anthracnose from the seedling to the
harvest stages and to chlorosis. Resistant to the pest *Nupserba
bicolar* THOMS. s. sp. *postbrunnea* BROWN.