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Short Communication

Kenaf - A Promising Fiber Crop with a Brighter Tomorrow

Md Al-Mamun*

Principal Scientific Officer, Breeding Division, Bangladesh Jute Research Institute (BJRI), Dhaka, Bangladesh

***Corresponding Author:** Md Al-Mamun, Principal Scientific Officer, Breeding Division, Bangladesh Jute Research Institute (BJRI), Dhaka, Bangladesh.

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Kenaf (*Hibiscus cannabinus* L.) is an herbaceous annual plant and an essential source of raw material for fiber and paper-based industries. Kenaf is classified within the Malvaceae family, where most of the chromosomes are bivalent, with only a few univalents and no trivalent or quadrivalent. Kenaf has approximately 120 names, including mesta, roselle, treal, ambary hemp, and rama, reflecting the fibrous species' diversification and widespread use. Kenaf is considered a jute substitute and has received great attention due to its status as a multi-purpose fiber crop. Traditionally, kenaf is cultivated mainly for its fiber production. New methods of utilization have seen kenaf usage in animal feed, filtration media, board making, potting media, oil absorption, pulping, paper making, car interiors, building boards and even athletic wheelchairs. Kenaf can be used for a variety of purposes including paper, pulp, animal bedding, construction materials, and carpet backing. It is presently cultivated for multiple uses such as thermal insulation boards, pulp, energy sources and building materials. Kenaf is used as raw material and as an alternative to wood in pulp and paper industries to avoid deforestation. Chemically modified kenaf fiber can also be used as a sorbent material for wastewater purification, smart textiles, electrostatic discharge protection, and composite reinforcement.

Kenaf fibers are among the foremost important fibers for bast fibers, which produce a high-quality pulp suitable for industrial and textile uses (for carpets, canvases, sacs, cordages, ropes, etc.). On the other hand, the bast fibers are still the first source of income for kenaf farmers, diversifying into new markets like nonwoven fabrics and reinforced composite materials used in automotive, packaging, aerospace, and other industrial applications. Furthermore, the core (inner part) with high hemicellulose and cellulose is used as an adsorbent in animal bedding and bioethanol production. Kenaf core fibers had higher holocellulose and lignin content than kenaf bast fibers. Still, kenaf bast fibers had higher cellulose, extractive, and ash content than both kinds of kenaf fibers. Different parts of kenaf and allied fiber crops in various forms could also be used directly to treat several human diseases and its use as herbal medicine to regulate or prevent dysentery, worms, and constipation has been reported. As a result, kenaf is considered a two-in-one non-food crop grown for both fiber and oil. Many researchers have investigated kenaf as a low-cost, recyclable, renewable, and biodegradable alternative to synthetic polymers.

Kenaf leaves are used as vegetables due to their high antioxidant and phenolic content. Hence, the leaves are a delicacy and are used as ingredients for sausages in the southern part of India and Africa. Kenaf leaves and petioles contain 15 to 30% crude proteins with high digestibility. Kenaf seeds could also be used as a medication for various health complications and diseases, such as cholesterol poise, some forms of cancers, and blood pressure. Kenaf seed oil and kenaf seed extraction may well be a possible sources of common anti-cancer agents. In addition, kenaf could be a potentially suitable species for phytoremediation within the ecliptic, with the common goal of biomass production, especially to recover the biological and financial value of degraded areas. Furthermore, kenaf plants have the flexibility to soak up phosphorus and nitrogen from the soil because of their ability to accumulate carbon dioxide emissions at a high rate.

Kenaf is believed to have originated approximately 4000 B.C. in ancient Africa. Kenaf is a cellulose source native to east-central Africa. Now kenaf is grown in more than 20 countries, primarily in Thailand, India, and China. Similarly, it is a vital crop for fiber production in Mediterranean countries, where it received a lot of attention as a polyvalent crop for pulp, energy, fervent filling boards, and bast fiber is employed for the recovery of thermoplastic compounds.

At present kenaf is not a priority crop in any country but is rather a substitute or alternate crop in most cases. With the launching of a global campaign for environmental awareness, international opinion is being created on natural fibers like kenaf for its expand-

ed production and uses, as it is biodegradable and friendly to the environment. Hence, thrust should be given to varietal development in the future to develop varieties having short field duration i.e., early maturing, higher fiber and seed yield, better fiber quality and resistance to biotic and abiotic stress. To overcome these issues, systematic collection, characterization, and use of diverse kenaf genetic resources are required. Seed production is a major problem in the fiber crop sector, especially in kenaf and mesta. The expansion of kenaf in Bangladesh has been limited by a shortage of quality seed. Quality seeds of an improved variety itself provide a 20% additional yield of the crop. Seed production of kenaf in the late season could be done by direct seeding on dry cultivated land or transplanting of seedlings or planting of top cut like jute between July and September. The off-season seed production following proper procedure can solve the problem with the lack of quality seed.

Kenaf is an important industrial crop and a renewable source for the bio-composite sector, however genetic information is scarce on the plant, preventing commercialization. Fibre characteristics and yield enhancements are limited, however, because of a lack of genomic data, such as full genetic maps and quantitative trait loci (QTLs) for fibre-related behaviours. Farmers should follow the scientific procedure of kenaf cultivation to expand local and international markets for kenaf fibre and commodities. The government must be involved and insured for the crop to provide a market situation that encourages farmers to plant this commodity. The athwart must also execute an excellent kenaf cultivation method to ensure a constant supply of decent attribute kenaf fibres to meet the rising emergence of kenaf bio composites. Kenaf is currently processed using traditional retting methods. The retting process has a bearing on the fibre's properties. Kenaf tolerated to drought and salinity moderately. The goal of kenaf breeding within the near future is to enhance salt resistance, insect resistance, drought-tolerant transgenic breeding, and herbicide resistance, additionally to create a molecular marker heritable linkage map, clone a kenaf functional gene, and locate QTLs for a few of the plant's most significant monetary qualities. Bright kenaf fibre encompasses a higher market price than the existing one, so emphasis may be implemented on ongoing research plans and commercial policies to develop a new cultivar of bright fibre. Kenaf cultivation should be done per modern scientific methods to fulfil this demand on the world market, and a spread of recent and different Kenaf products should be produced.