

Creative Trait Discovery



ABOUT US ➡➡

Founded in 2007, **Bench Bio Private Limited (BenchBio)** is a privately held Indian start-up company with strong European links providing biotechnology solutions to the agricultural sector worldwide. BenchBio is located at Vapi (Gujarat) near Mumbai and is focusing on discovering important traits in plants both for agricultural and consumer value.

BenchBio is taking advantage of the freely available DNA sequence information for numerous crops being made publicly available in large numbers. BenchBio does reverse genetics and works with an organisms' own genome (DNA) and therefore the method is non-transgenic (no foreign DNA added). There are significant advantage of this method; it is consumer friendly and most importantly the cost and time to develop new varieties is reduced significantly because regulatory hurdles are non-existent.



FACILITIES ➡➡

The company's advanced biotechnology laboratory facilities are complemented by extensive field work capacity. Laboratory equipment includes Licor 4300 and ABI 3130X genetic analyzers. Field sites are available at four locations across India.

BenchBio has temperature controlled glasshouses including state of the art air conditioned glasshouse. These facilities enable BenchBio to satisfy, with precision, temperature requirements for a very wide range of world crops.

BenchBio has strengths in bioinformatics, molecular biology, plant biochemistry and plant breeding. In addition, the company has unique access to a network of outstanding scientists, plant breeders and business advisors through out India and Europe.



TECHNOLOGY ➡➡

BenchBio is creating, as well as discovering, alleles using a non-transgenic (Non-GM) method known as "Allele Discovery Platform (ADP)" which is a variation of the TILLING and EcoTILLING method as described by Colbert et al, 2001(1) enabling the creation of plants with novel traits for added commercial value.

Genetic variability is created and alleles discovered using a high-throughput screening method from mutation-induced plant populations. BenchBio's unique Mutation- Allele Discovery Platform (M-ADP) system identifies beneficial pre-determined traits. In parallel Natural populations (Germplasm collections) are studied using the Natural Allele Discovery Platform (N-ADP) system. The technology is applied to improve food, feed and non-food crops.



SUCCESS ➡➡

BenchBio's successfully completed recent projects include generating large mutant populations of many European crops including cereals, vegetables and ornamentals. BenchBio has recently also created tomatoes with a long shelf- life that are being evaluated.

RESEARCH SERVICES ➡➡

CUSTOM MUTANT POPULATION CREATION ➡➡

BenchBio is well equipped to create mutant populations of various sizes. BenchBio recommends a minimum of 3000 M1 plants, but the greater the population, the higher the success of recovering more alleles. BenchBio is routinely generating mutant populations of 1000-5000 M1 plants. Mutant populations of 5000 to 10,000 M1 plants or more can be accommodated. Please discuss with BenchBio for mutant population greater than 20,000 M1 plants. In all cases the Client has full rights over the population and material is 100% secure.





M-ADP: MUTATION SCREENING AT THE DNA LEVEL (TILLING) ➡➡

The method allows creation and detection of novel alleles from mutant populations.

Steps involved in this process are:

Grow out M2 population

Harvest leaves for DNA extraction

DNA quantification, normalisation and pooling

Mutation Screening (3 options are available)

Half Service 1

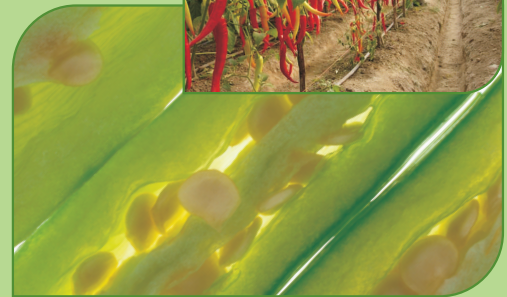
DNA, primer and genomic sequence information provided by the Client, minimal bioinformatic analysis required.

Half Service 2

DNA sequence accession number provided by the Client, bioinformatic analysis required.

Full Service

M1 plants generated, M2 seeds harvested, M2 DNA provided by BenchBio, sequence accession number given, bioinformatics analysis required.



N-ADP: NATURAL ALLELE SCREENING AT THE DNA LEVEL IN GERmplasm COLLECTIONS (Eco-TILLING) ➡➡

The method allows discovery of natural alleles from Germplasm collections.

Two options are available:

Half Service:

The Client supplies the Germplasm DNA and screening of alleles done via three routes as indicated under M-ADP system

Full Service:

The Client supplies the Germplasm seeds, BenchBio grows the material, extracts DNA and screening of alleles done via three routes as indicated under M-ADP system.



BACKCROSSING ➡➡

Before the mutants are ready to be released as a variety, it is important to carry out one or two backcrosses to the original parents to remove background mutations.

FORWARD SCREENING (Phenotype to Genotype) ➡➡

One of the by-products of mutant population creation is Forward Screening of M2 population. M2 plants are grown and systematically phenotyped for novel traits that can be stored in a searchable database.



CONTRACT RESEARCH COLLABORATION ➡➡

BenchBio, a science driven company, places significant emphasis on science based discoveries. Open to research collaboration with both private and public laboratories in India and worldwide, BenchBio's goal is collaboration with clients via Research & Development (R&D) and seek grants wherever possible, to generate publications, patents and or commercial products. BenchBio has pragmatic and realistic approach to intellectual property ownership. Contact BenchBio for more details.

BIOTECHNOLOGY CONSULTING

BenchBio has strong in-house expertise and has established links with a unique network of biotechnology experts worldwide. The company can provide professional consulting to guide clients in areas such as high quality seed production, tissue culture, construct making for genetically modified (GM) work including RNAi's, transgenic plant evaluation, promoter evaluation and discovery. BenchBio will be pleased to advise.



CASE STUDY ➡➡

BenchBio has strong links with top European plant research teams. Prior to forming BenchBio, the founder worked at NIAB (National Institute of Agriculture Botany), Cambridge, UK and collaborated with Dr Abdelhafid BENDAHMANE, Director of Crop Research at URGV, Evry, France who is also scientific advisor to the company. Other advisors include Prof. Cathie MARTIN from the John Innes Centre, UK.

As proof of concept, a mutation in LE and other pea genes was detected in peas (2) and a pea phenotype database created (3) by Dr BENDAHMANE's laboratory. Other recent work includes identification of melon necrotic spot virus (MNSV) resistance in melons (4) and changing sex of melon flowers (5). BenchBio now offers a non-GM strategy against pathogen infection and other useful traits in crops in addition to creating phenotype databases in various crop species.



References: ➡➡

1. Colbert et al., Plant Physiol (2001), 126:480-484
2. Triques et al., Plant J, (2007), 51 : 1116-11125
3. Dalmais et al., Genome Biology, (2008), 9: R43
4. Nieto et al., BMC, Plant Biol, (2007), 7:34
5. Boualem et al., Science (2008), 321: 836-838.



REGISTERED OFFICE ADDRESS :

C/o Jai Research Foundation
Nr. Daman Ganga Bridge,
Valvada, Dist Valsad, Gujarat - 396108, India

POSTAL ADDRESS:

P.O. Box No.34, Vapi,
Dist Valsad, Gujarat,
India - 396195, India

Tel.: +91-260 6544244

+91-260 6532244

Fax: +91-22 66466908

E-mail: info@benchbio.com

www.benchbio.com

