

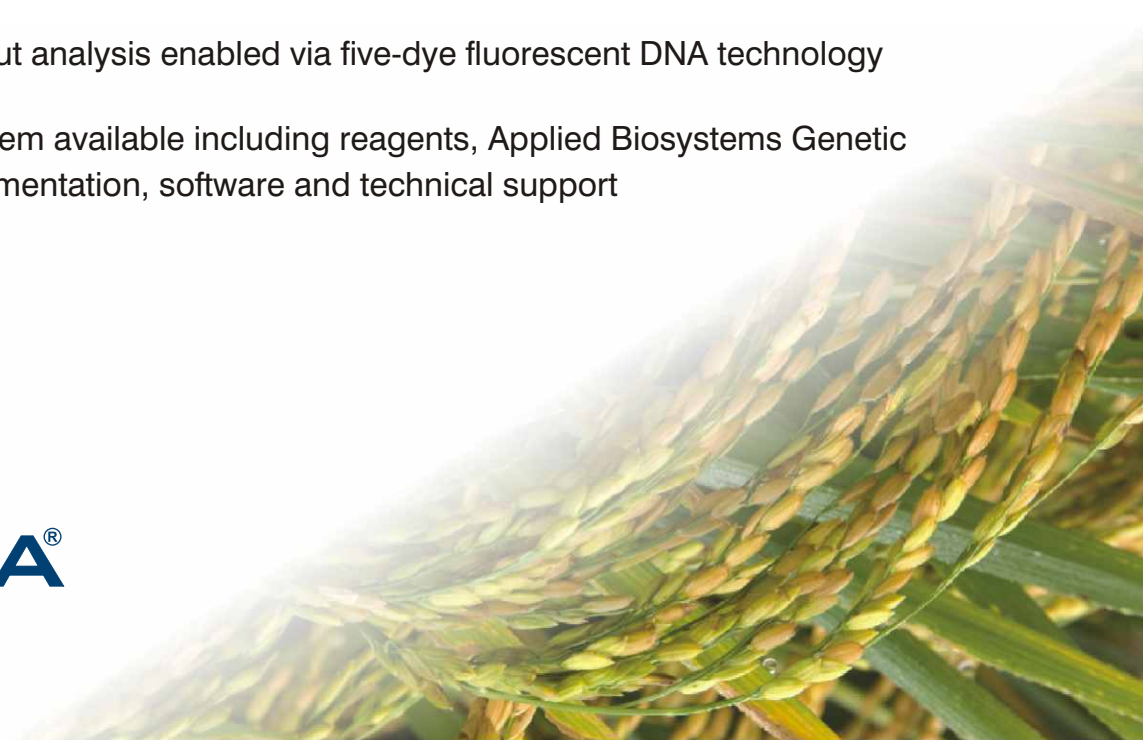
# Basmati Verifiler™ Kit

Genotyping Kit for Adulteration Detection



- World's first kit-based product for testing the authenticity of Basmati rice samples
- Specific microsatellite profiles of loci common to all major Basmati varieties to distinguish traditional Basmati from evolved and non-Basmati unambiguously
- “Single-tube assay” to co-amplify eight microsatellite loci
- High throughput analysis enabled via five-dye fluorescent DNA technology
- Integrated system available including reagents, Applied Biosystems Genetic Analysis instrumentation, software and technical support

**LABINDIA®**



Basmati (from the Hindi word for fragrant) is a special rice cultivated exclusively in the Indo-Gangetic plains. Basmati's reputation as premium long grain rice is known worldwide and is preserved in traditional varieties. Its high value stems from the grain's characteristic aroma in both the raw and cooked state. The grain also possesses a distinctive shape, which on cooking elongates to almost double its length whilst its width remains the same. Two thirds of the total Basmati exported to Europe and the Middle East comes from India. In recent years, sales of Basmati rice have increased by around 12% annually (Agricultural and Processed Food Products Export Development Authority (APEDA), India). Consumer preference generates higher returns for traditional Basmati varieties leading to strong brand equity. Thus, the deliberate addition of non-Basmati rice to Basmati rice would offer a significant cost advantage to dishonest suppliers. Hence to protect the interests of consumers and rice-trading community in general, identification of genuine Basmati rice samples is vital. Exporting firms and countries would be serving themselves well in ensuring that the purity of Basmati rice is maintained. Likewise, countries importing Basmati would be protecting the consumer's interest if they ensure that the Basmati being imported is genuine and tested.

Considering the sheer volume and revenues involved in the Basmati trade, a high-throughput and accurate identification method is essential. In fact, a number of Basmati importing countries demand that all Basmati imports carry a mandatory certificate of purity based on a DNA test.

**World's First Single-tube, Multiplex, Microsatellite Assay-based Kit for Basmati Authentication**

LABINDIA is pleased to announce the release of the Basmati Verifiler™ Kit; the world's first product for establishing the authenticity of Basmati rice samples. The kit is manufactured and marketed by Labindia and was developed by a group of scientists from the Centre for DNA Fingerprinting and Diagnostics (CDFD) in Hyderabad, India. The kit uses a PCR amplification technique based on Simple Sequence Repeats (SSR) that provides the single most discriminating assay for Basmati genotyping. The high resolution of the fluorescence-based microsatellite assay provides highly reproducible data with as low as 5 ng of DNA per PCR reaction. The Basmati Verifiler Kit simultaneously amplifies 8 SSR loci in a single, robust amplification reaction.

Traditionally used morphological and chemical parameters are not discriminative enough to correctly identify pure Basmati rice. The use of SSR by the Basmati Verifiler Kit is efficient enough to detect genetic diversity within and among various Basmati rice cultivars. This makes the kit highly efficient and cost-effective in

detecting high levels of polymorphism in rice. The kit exploits well-characterized Basmati rice specific molecular markers which are used as molecular tags for the identification of true Basmati varieties.

**Speed and Throughput**

Analyzing different genetic markers usually calls for the amplification of products using separate PCRs with individual analysis for each marker. To simplify this process, the Basmati Verifiler Kit employs a robust, eight-locus multiplex PCR, which significantly reduces the preparation time and effort required for amplification and analysis. With the Basmati Verifiler Kit, one can perform a single multiplex PCR followed by capillary electrophoresis to test the authenticity of the rice sample.

The Basmati Verifiler Kit uses unique and laboratory-tested primer sequences. Allele sizes range between 70 to 350 base pairs for robust PCR amplification of all loci. When used with an AB platform, the kit provides an integrated approach, and the flexibility to choose from a wide range of Applied Biosystems (AB) Genetic Analyzers depending on the throughput requirement (see Table 1).



Applied Biosystems 3130 Genetic Analyzer

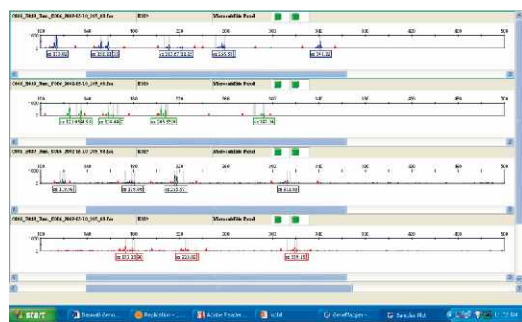
AB System	Samples per run	Number of runs per day	Days in operation	Samples processed per year
3130	4	16	250	16,000
3130xl	16	16	250	64,000
3730	48	16	250	1,92,000

**Table 1:** Examples of sample throughput for genotyping based upon 9 hour workday.

**Five Dye Technology**

The use of fluorescent dyes (6 FAM, VIC or NED) to label DNA fragments for automated fragment analysis has drastically increased throughput. With the increased number of dyes now available it has become easier to multiplex more loci in a single capillary injection. The new

dyes 6 FAM, VIC, NED and LIZ offer a wider spectral range extending to 610 nm. The expanded spectral profile minimizes spectral overlap thus leading to more reliable data.



**Fig 1:** Five dye multiplexing for better throughput

### Kit Data Satisfies Recommendations of Indian and European Regulatory Agencies

The data generated using the Basmati Verifiler™ Kit from the eight microsatellite loci also satisfy the recommendations of the government agencies regulating the Indian (APEDA) and European markets (Food Standard Agency, UK). Due to strict legislations governing the export market, the combination of loci included in the Basmati Verifiler™ Kit makes it the best technology available to establish Basmati authenticity before being labeled as such.

### Integrated System for Generating and Analysing Data

LABINDIA offers a completely integrated system including reagents, instruments and software for generating and analyzing data via the Basmati Verifiler™ Kit. DNA samples amplified using this kit can be analyzed on a variety of AB Genetic Analysis instruments that accommodate the throughput levels of different individual laboratories. (The instrument must be equipped with a version of data collection software that is capable of five dye analysis and the instrument calibrated with suitable matrix standards).

Experienced technical application specialists are available to answer your questions regarding the kit. Labindia also offers field application support experts who provide on site support in the use of our product line. We also offer complete training courses to help you implement SSR technology in your laboratory.

### Technical Procedure

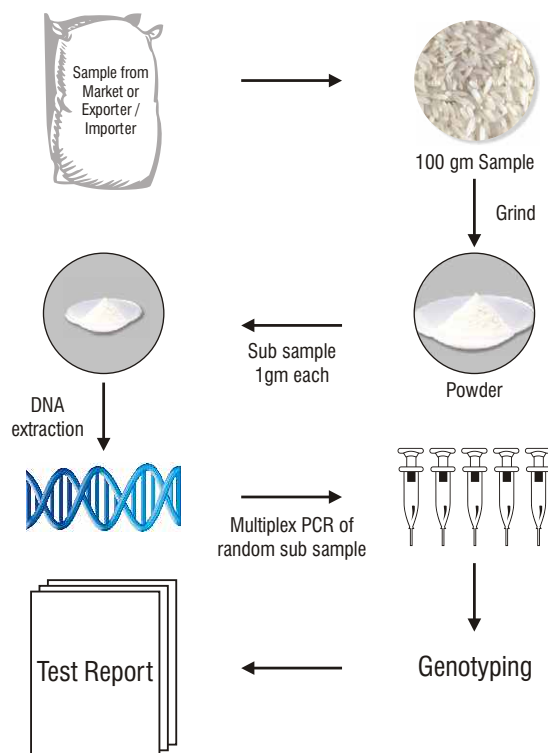
**The procedure involves the following basic steps:**

**DNA extraction:** Isolate DNA from rice grains using any commercial column-based DNA extraction kit. Each rice sample should have at least 100g of grain powder, from which a minimum of three sub-samples of 1g each should be randomly drawn and bulked for DNA extraction.

Quantify the DNA and adjust to an optimum level.

**PCR amplification:** Set up a 10µl PCR reaction comprising of DNA template, PCR mixture (AmpliTaq® Gold, dNTPs, MgCl<sub>2</sub>) along with labeled primers. After an initial denaturation step, the PCR mix is subjected to a fixed number of amplification cycles followed by the extension step.

**Genotyping:** This can be performed on any of the AB Genetic Analyzers using specific running modules. The PCR product is mixed with size standard GeneScan™ 500 LIZ® before being injected on the instrument. Subsequently, allele sizes are called using the GeneMapper® software from AB.



### Kit Components

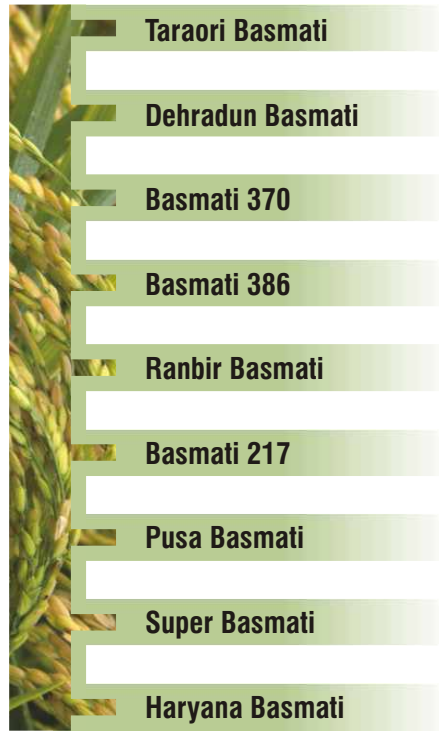
Each Basmati Verifiler Kit contains a pre-formulated PCR reaction mix, blended primer set along with pure Basmati DNA as a control. The kit provides sufficient reagents for 100 reactions. The PCR reaction components, primer sequences and amplification protocols have all been developed to provide specific, robust amplification. The Kits are subjected to rigorous quality control testing to ensure reliable performance.

### Ordering Information

Description	Quantity	Part no.
Basmati Verifiler™ Kit*	100 tests	BV81001
Genescan 500 LIZ**	800 reactions	4322682

\* Order from Labindia

\*\* Order from AB



Visit us at :

[www.labindia.com/basmati](http://www.labindia.com/basmati)

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