

phytoanalysis

Phytowelt GreenTechnologies is a worldwide operating company whose core business is agricultural science and plant biotechnology. Our mission is to bridge white and green biotechnology expressed in our motto

“plantdustrial – linking plant and industrial biotechnology”

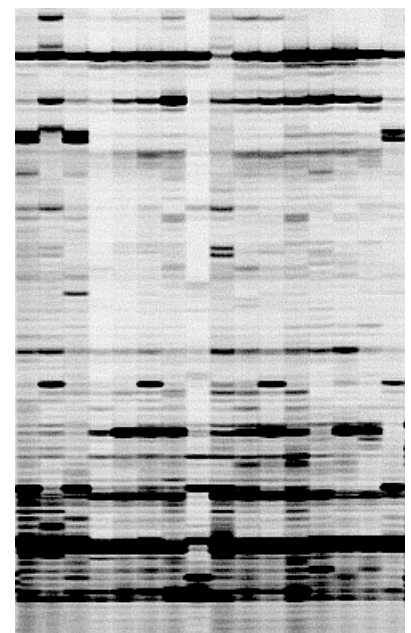
Phytowelt possesses a unique and wide-ranging service termed **phytoplus** to exploit plant biodiversity and gain added value in and out of plants. This service package consists of **phytodiversity** to create plant biodiversity by intra- and interspecific hybridization, **phytochemistry** to exploit renewable plant substances for the chemical industry and **phytomining** to take advantage of plant metabolites and enzymes. Another important element is **phytoanalysis**, an approach to detect and analyse plant biodiversity by morphological, biochemical and molecular marker techniques.

phytoanalysis provides custom DNA marker analytical services and data interpretation. Our fast, low cost and reliable genetic marker methodology ISTR can be applied to nearly any biological material and species. We offer a complete service starting with cultivation and (morphological) characterization of the biological material, followed by DNA purification and marker analysis. Optionally, marker cloning and DNA sequencing can be requested.

oil crops (coconut and oil palm, rapeseed, soja) and others like **cassava, potato, sugar beet, tobacco, tomato** or **herbs** like mint and parsley. Non-crop plant material has been tested as well, like **arabidopsis, trees** (cedar, pine, eucalyptus) or various **ornamental plants** (heather, petunia, roses, forsythia and snapdragon).

ISTR Methology (inverse sequence-tagged repeat) is a PCR-based DNA marker technology. It was developed on the basis of mobile genetic elements (retro-transposons) found in plant, human, animal and microbial genomes. The ISTR technique uses the ubiquitous presence of reverse transcriptase sequences of these elements, as depicted in Figure 1. Specific primer pairs are used to produce PCR fragments of specific length building probe-characteristic fingerprints (polymorphism analysis). Important crop plants have been subjected to ISTR analysis including **cereals** (barley, maize, rye and wheat), **fruits** (grapevine, guava, plum, strawberry),

Figure 1:
Example of an ISTR analysis. Different cultivars of one species were analyzed using one set of ISTR primers. Cultivars could be easily distinguished by different distribution of the bands. The lengths of fragments are typically in the range of 0.1 to 2 kb.



In comparison with currently available methodologies, ISTR represents a significant breakthrough in terms of price, facility, precision, flexibility and speed. The characteristics of ISTR are summarized in box 1.

- Simple DNA extraction
- Universal primers
- Moderate infrastructure required
- Non-radioactive laser detection system
- High number of polymorphisms detected
- Large amount of loci (>5 to 100) amplified
- High reproducibility
- Applicable for the analysis of plant, animal, human and microbial DNA

Box 1: Characteristics of **ISTR**

plantdustrial – linking plant and industrial biotechnology

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