Anaerobic gas lift reactor (AGR): A high rate anaerobic digester for the generation of biogas and bio-manure from food waste

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High rate biomethanation of food waste (FW) with anaerobic gas lift reactor (AGR) for the simultaneous generation of biogas and bio-manure was examined in laboratory scale reactors. The experimentations divulged that, FW having an average total solids (TS) and volatile solids (VS) in the range of 15 to 18% and 10 to 14%, yielded biogas of 0.5 to 0.6 m³/(kg VS reduced) and bio-manure of 0.3 to 0.4 kg/(kg FW). M/s Ahuja Engineering Services Pvt. Ltd, Hyderabad has installed a plant at one of the kitchens of Akshaya Patra Foundation at Bellary, Karnataka for the generation of biogas and bio-manure from the FW. The plant is based on AGR: A high rate biomethanation technology developed by CSIR-IICT and the aim of this plant is to serve a sustainable technology to provide a scientific waste disposal system to the kitchen FW as well as to utilize the clean fuel (biogas) produced as a cooking fuel to replace LPG. Approximately 1000 kg of food waste and 500 liters of organic wastewater (boiled rice water/gruel water) are used for the generation of 80 to 100 m³ of biogas per day to replace 40 to 50 kg of LPG.

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Grape breeding for subtropical grapes for fresh consumption and processing

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Grape growing is now become a challenge under sub-tropical regions of North Indian plains because occurrence of pre-monsoon rain during fruit maturity deteriorates the fruit quality and reduces yield drastically. The genetic grape breeding program conducted by the Indian Agricultural Research Institute-aims at the development of new cultivars which combine the characteristics of extra-early maturity along with better berry quality traits in terms of total soluble solids, characteristics berry color, berry size and yield. The basic germplasm used in the crossing program was consisted of V. vinifera varieties like Perlette, Pusa Urvashi, Pearl of Csaba, Beauty Seedless, Bharat Early, Banqui Abyad and Hur. Breeding methods adopted includes modern techniques (embryo-rescue) as well as traditional approaches. An efficient embryo-recue technique is however critical for breeding seedless grapes when using stenospermocarpic female parents. It resulted into development of dozens of hybrids found promising in terms of extra-early maturity as well as berry quality. As a result four promising hybrids viz., ER-R2P36(Pearl of Csaba×Beauty Seedless), ER-R2P4(Pearl of Csaba×Perlette), ER-R2P20(Pusa Urvashi×Perlette) and R1P14(Cardinal×Beauty seedless) were found to be promising in terms of extra-early maturity (last week of May) under Delhi conditions as well as bunch and berry quality traits. Out of these four hybrids, ER-R2P36 was found most promising in terms of extra-early maturity (last week of May), high total soluble solid content (22.2 ºBrix), mild acidity (0.5%), medium berry weight (2.1 g), medium bunch weight (355.2 g) of seedless black colored berry. Therefore, outcome from this breeding program is significant for grape growing under subtropical regions of North Indian plains.

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