

RESEARCH

Open Access



Ectopic expression of *AtDGAT1*, encoding diacylglycerol *O*-acyltransferase exclusively committed to TAG biosynthesis, enhances oil accumulation in seeds and leaves of *Jatropha*

Devendra Kumar Masari<sup>1</sup>, Sanjeev Kumar<sup>2</sup>, Prabin Kumar Sharma<sup>1</sup>, Yasufumi Kobayashi<sup>1,3</sup>, Vaidhyan V. Goud<sup>1,4</sup>, Nozomu Sekura<sup>2</sup>, Hiroyuki Koyama<sup>3</sup> and Lingaraj Sahoo<sup>1,2\*</sup>

# Transgenic *Jatropha* overexpressing *AtDGAT1* gene enhanced seed oil by 30% suitable for biodiesel production



*AtDGAT1* transgenic *Jatropha*



Seeds of *AtDGAT1* transgenic *Jatropha*

- 30% enhanced seed oil
- Higher TAG & DAG
- Lower FFA



Oil extraction



Transesterification

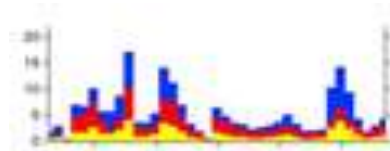
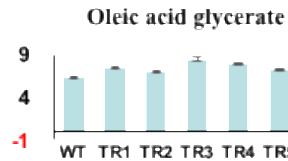
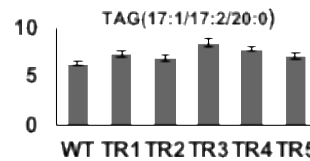


Biodiesel Blends

- Transgenic Biodiesel oil blends 5%, 10%, 15% & 20%
- Non-transgenic Biodiesel oil blends 5%, 10%, 15% & 20%



Limitless applications



Fuel performance analysis

- Brake specific fuel consumption (BSFC)
- Brake thermal efficiency (BTE)
- Exhaust gas temperature (EGT)
- CO emission



IC diesel engine testing

Physical & Chemical properties of Biodiesel blends

- Viscosity
- Calorific Value
- Pour point
- Flash point
- Cetane number
- Thermal conductivity

