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# Physicochemical properties of *Cnidoscolus rostratus* seed oil as feedstock for biodiesel production

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**Background**: Biodiesel fuel is increasing attention worldwide as a blending component or a direct replacement for diesel fuel in vehicle engines and is necessary to study its physicochemical properties.

**Objective**: The aim of present study is to explore the utility of *Cnidoscolus rostratus* seed oil (CRO) as a potential resource to be transformed into *Cnidoscolus rostratus* biodiesel (CRB). Properties such as density, iodine value, kinematic and dynamic viscosities, acid value, and gross heating value of oil and biodiesel made from CRO were evaluated and compared with specifications in the ASTM D 6751.

**Methods**: The seeds from *C. rostratus* were collected in June, 2016 from the community of Acaquizapan, Chazumba, Oaxaca State, Mexico. The Oil of *C. rostratus* seed (60 g) was extracted by means a soxhlet apparatus. A transesterification reaction was performed to yield 25 mL of the fatty acid methyl esters (FAMEs). The composition of *C. rostratus* seed oil was estimated by gas chromatography (GC). The CRO and CRB properties included, density, kinematic and dynamic viscosities and were estimated using a Stabinger SM300 viscometer. Gross heating values were determined in a Parr 6400Cal isoperibolic calorimeter.

**Results**: Results indicated that *C. rostratus* seeds contain 42% oil (w/w), and the acid value of the oil was 0.24 mg KOH/g. CRB has a high content of linoleic (62%) and oleic (16%) acids. Physicochemical properties such as density, kinematic and dynamic viscosities at 20°C were 0.8778g/cm$^3$, 6.3022mm$^2$/s and 5.5322mPa.s, respectively. When diesel and biodiesel were blended, the kinematic viscosity decreased nonlinearly with increasing temperature from 6.3022 g/cm$^3$ to 1.1279g/cm$^3$. While the blend density of *C. rostratus* biodiesel, decreased linearly from 0.8778g/cm$^3$ to 0.7706g/cm$^3$ with increasing temperature. The gross heating value of oil and biodiesel was 39.32 kJ/kg and 39.71 kJ/kg respectively.

**Conclusions**: Biodiesel in this study was prepared through KOH catalyzed methanolysis from the transesterification of Cnidoscolus rostratus seed oil. An investigation was performed on the effect of temperature on density and viscosity when diesel and biodiesel were blended. Density and viscosity decreased linearly and nonlinearly, respectively with increasing temperature.

## Biography

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**Notes:**