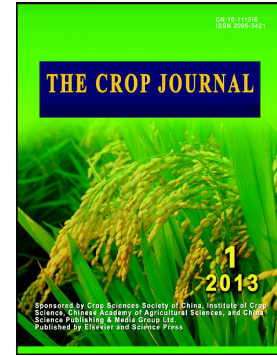


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## Near-infrared reflectance spectroscopy reveals wide variation in major components of sesame seeds from Africa and Asia

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**Abstract:** Sesame is an important oilseed crop in Africa and Asia, owing to its high nutritional quality seed and market value. Variation in sesame seed components including oil, oleic acid, linoleic acid, and protein was investigated by near-infrared reflectance spectrometry in 139 samples collected from different countries. Oil and protein contents were between 40.8% and 60.3% (mean 53.0%) and 15.5% to 25.5% (mean 20.4%), respectively. Linoleic acid, ranging from 31.8% to 52.4% (mean 46%) was more abundant than oleic acid (31.8%–50.6%, mean 38.1%). Light-seeded samples displayed higher nutritional quality, as they were richer in oil, protein, and linoleic acid than dark seeds. Samples from Africa had higher oil and linoleic acid contents, while Asian samples had higher oleic content. The analysis revealed West African sesame cultivars containing especially high levels of seed components, which may command high market values. Two clusters of sesame samples grouped by seed composition were obtained, including one cluster with high oil and oleic acid content and the other with high protein and linoleic acid content. This study revealed that sesame samples from Africa and Asia harbor high variation for major seed components and also provided background information for breeding high-nutrition varieties according to the demands of sesame seed markets.

**Keywords:** *Sesamum indicum*; Major seed components; Variation; Asia; Africa; NIRS

### 1. Introduction

Sesame (*Sesamum indicum* L.) is an ancient crop, considered as the “queen of the oilseeds” because of its oil’s high stability and nutritional quality. It is a traditional and highly valued health food in Asia and Africa, which account for 96% of the world sesame seed production [1].

Sesame is grown mainly for its seeds, which have one of the highest oil contents among major oilseed crops [2]. It is also rich in proteins, carbohydrates, vitamins, polyunsaturated fatty acids, lignans (sesamin and sesamol), tocopherol, phytosterols, phytates, and other micronutrients [3]. Sesame seed is thus a reservoir of nutritional components with numerous beneficial effects in humans, including antioxidant, antiaging, antihypertensive, anticancer, cholesterol-lowering, and antimutagenic properties [4].

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