bitterness and lower stability may reduce consumer acceptance. In other words, the medicinal value of buckwheat is not automatically guaranteed by the plant itself. It depends heavily on compound standardization, processing control, and bioavailability studies.

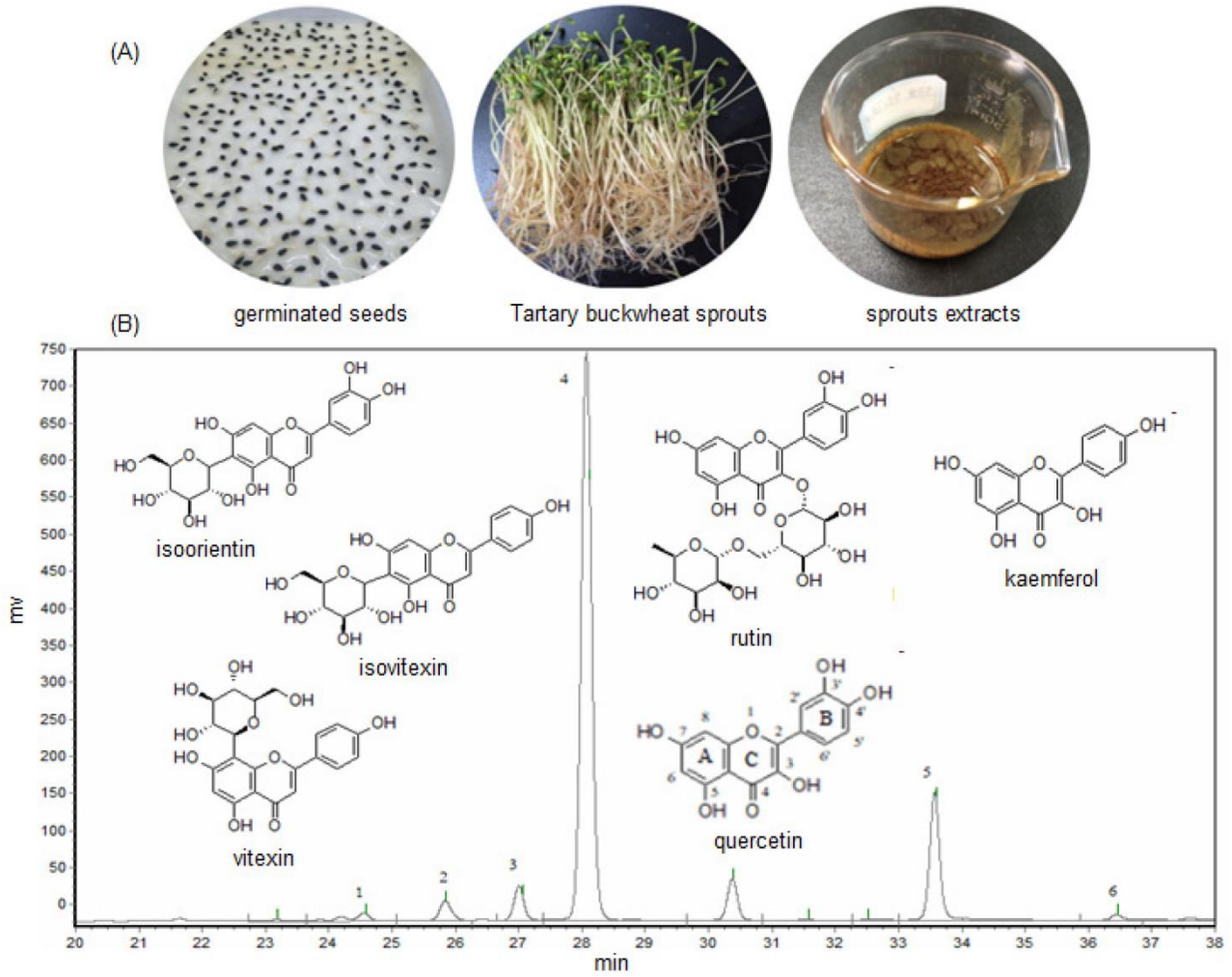

Figure 3 The germinated seeds, sprouts, and methanol extract (A), and the typical HPLC chromatogram of methanol extract (B) of Tartary buckwheat sprout cultures. Here, 1—isoorientin, 2—vitexin, 3—isovitexin, 4—rutin, 5—quercetin, 6—kaemferol (Adopted from Zhong et al., 2022)

6.2 Antidiabetic and cardiovascular protective effects

The health effects of Tartary buckwheat as a functional food are mainly related to the combined actions of dietary fiber, resistant starch, D-chiro-inositol, rutin, quercetin, and other polyphenols. Buckwheat may regulate metabolism by slowing carbohydrate digestion and absorption, improving insulin sensitivity, and reducing oxidative stress caused by hyperglycemia. Buckwheat flavonoids, especially rutin and quercetin, may also contribute to cardiovascular protection through antioxidant activity, inhibition of lipid peroxidation, improvement of lipid metabolism, and maintenance of vascular endothelial function (Giménez-Bastida and Zieliński, 2015).

Zou et al. (2023) reviewed the bioactive compounds, health effects, and industrial applications of Tartary buckwheat and concluded that its antidiabetic and cardiovascular protective functions are associated with the combined effects of flavonoids, polyphenols, dietary fiber, proteins, polysaccharides, and D-chiro-inositol. Tartary buckwheat flavonoids and phenolic compounds may delay carbohydrate digestion by inhibiting α-amylase and α-glucosidase activities. They may also participate in blood glucose regulation through improved insulin sensitivity, modulation of gut microbiota, and reduction of oxidative stress.