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THREE-MICRON SPECTROSCOPY OF HIGHLY REDDENED FIELD STARS

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Broad absorption features centred at 3.45 μm and at 3.0-3.1 μm towards a number of late-type supergiants in the vicinity of the Galactic Centre have been repeatedly reported. Here, we present 2.0-2.5 μm and 3.0-4.0 μm spectra of field late-type highly reddened ($A_V \sim 17 - 27$) stars located in different regions of the galactic plane more than 20° away from the Galactic Centre direction. The observations, made with the 3.6m, 2.2m and 1.0m ESO telescopes at La Silla, Chile, consist of CVF spectra with resolution $\lambda/\Delta\lambda \simeq 100$ and IRSPEC spectra with resolution $\lambda/\Delta\lambda \simeq 700$. In the direction of the most highly reddened stars, definitive detections of the 3.45 μm and the 3.0-3.1 μm absorption features are reported. The 3.45 μm feature has been attributed to absorption arising in a vibrational transition resulting from the C-H stretching in organic compounds, while the 3.0-3.1 μm broader feature are tentatively attributed to O-H bonds. The observations strongly support that the agent producing the 3.45 μm feature, presumably organic molecules, is an important component of the diffuse interstellar medium and is not characteristic only of the Galactic Centre environment.