

Table 8

List of Reference Sample in JP

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Compound	Molecular Formula	CAS NO.	HPLC (1: Column, 2: Detect, 3: Column Temp., 4: Mobile phase)	TLC condition (1: Dev. solv., 2: Detect)	Color tone on TLC	Application	Name of crude drug	Purchase Information	Japanese name of crude drug
Bergenin	C ₁₄ H ₁₆ O ₉	477-90-7		1: AcOEt/EtOH (95)/H ₂ O (100:17:13), 2: UV (254 nm)	dark blue	TLC (Identification)	MALLOTI CORTEX	Bergenin Standard 20,000JPY/20mg (WAKO)	Akamegashiwa
Barbaloin	C ₂₁ H ₂₂ O ₉	1415-73-2	1: ODS column (i.d. 6 mm x 15 cm), 2: 360 nm, 3: 30°C, 4: H ₂ O/CH ₃ CN/AcOH (100) (74:26:1) adjust flow rate to elute barbaloin at ca.12min	1: AcOEt/Ac ₂ O/H ₂ O/AcOH (100) (20:5:2:2), 2: UV (365 nm)	red	TLC (Identification) HPLC (Component determination)	ALOE ALOE PULVERATA	Barbaloin Standard 8,500JPY/10mg (WAKO)	Aroe
Arbutin	C ₁₂ H ₁₆ O ₇	497-76-7	1: ODS column (i.d. 4.6 mm x 15-25 cm), 2: 280 nm, 3: 20°C, 4: H ₂ O/MeOH /0.1mol/L HCl (94:5:1) adjust flow rate to elute arbutin at ca.6min	1: HCOEt/H ₂ O/HCOOH (8:1:1), 2: dil. H ₂ SO ₄ (1 in 2), 105°C, 10 min	Yellow-brown to blackish brown	TLC (Identification) HPLC (Component determination)	UVAE URSI FOLIUM	Arbutin Standard 9,000JPY/20mg	Urushi
Dehydrocorydaline nitrate	C ₂₂ H ₂₄ N ₂ O ₆		1: ODS column (i.d. 4.6 mm x 15 cm), 2: 340 nm, 3: 40°C, 4: dissolve NaHPO ₄ 12H ₂ O (17.91g) in H ₂ O (970ml) and adjust to pH 2.2 with HgPO ₄ . Then, add NaClO ₄ ·H ₂ O (14.05g) to this solution and add H ₂ O to make exactly 1000ml. To this solution, add CH ₃ CN (450ml) , then add sodium laurylsulfate (0.2g) adjust flow rate to elute dehydrocorydaline at ca.24 min			HPLC (Component determination)	CORYDALIS TUBER	Dehydrocorydaline Nitrate Standard 19,800 JPY/10 mg	Engosaku
Parahydroxybenzoic acid	C ₇ H ₆ O ₃	99-96-7		1: AcOEt/EtOH (99.5)/H ₂ O (20:2:1), 2: UV (254 nm)	dark purple	TLC (Identification)	CATALPAE FRUCTUS		Kisassage
Amygdalin	C ₂₀ H ₂₇ NO ₁₁	29883-15-6		1: AcOEt/MeOH/H ₂ O (7:3:1), 2: dil. H ₂ SO ₄ , 105°C, 10 min	brown to dark green	TLC (Identification)	ARMENIACAE SEMEN	Amygdalin (90+%) 1,500 JPY/1 g (TOKYO KASEI)	Kyoin
Gentiopicroside	C ₁₆ H ₂₀ O ₉	20831-76-9		1: AcOEt/EtOH (99.5)/H ₂ O (8:2:1), 2: UV (254 nm)	dark purple	TLC (Identification)	GENTIANAE RADIX GENTIANAE RADIX PULVERATA GENTIANAE SCABRAE RADIX GENTIANAE SCABRAE RADIX PULVERATA	Gentiopicroside Standard 15,000JPY/10mg (WAKO)	Genchiana, Ryutan
Ginsenoside Rg1	C ₄₂ H ₇₂ O ₁₄	22427-39-0		1: Lower layer of CHCl ₃ /MeOH/H ₂ O (13:7:2), 2: dil. H ₂ SO ₄ , 110°C, 5 min	red-purple	TLC (Identification)	GINSENG RADIX RUBRA GINSENG RADIX GINSENG RADIX PULVERATA	Ginsenoside-Rg1 Standard 19,000 JPY/10 mg (WAKO)	Kojin, Ninjin
Magnolol	C ₁₈ H ₁₈ O ₂	528-43-8	1: ODS column (i.d.4-6mmx15-25cm), 2: 340nm, 3: 20°C, 4: H ₂ O/CH ₃ CN/AcOH (100) (50:50:1) adjust flow rate to elute magnolol at ca. 14 min			HPLC (Component determination)	MAGNOLIAE CORTEX MAGNOLIAE CORTEX PULVERATUS	Magnolol Standard 8,800 JPY/20 mg (WAKO)	Koboku
Schizandrin	C ₂₄ H ₃₂ O ₇	7432-28-2		1: AcOEt/hexane/AcOH (100) (10:10:1), UV (254 nm)	blue-violet	HPLC (Identification)	SCHISANDRAE FRUCTUS	Schizandrin Standard 15,700 JPY/20 mg (WAKO)	Gomishi
Saikosaponin a	C ₄₂ H ₆₈ O ₁₃	20736-09-8		1: CHCl ₃ /MeOH/H ₂ O (30:10:1), 2: H ₂ SO ₄ /EtOH (95) (1:1) 50°C, 5 min	blue to blue-purple	TLC (Identification)	BUJLEURI RADIX	Saikosaponin a Standard 19,600 JPY/12 mg (WAKO)	Saiko

Geniposide	C17H24O10	24512-63-8	1: ODS column (I.D. 6mm x 15cm), 2: 240nm, 3: 30°C, 4: H ₂ O/CH ₃ CN (22:3) adjust flow rate to elute geniposide at ca. 1.5 min	1: AcOEt/MeOH (3:1), 2: 4-methoxybenzaldehyde-H ₂ SO ₄ TS, 105°C, 10 min	dark purple	TLC (Identification) HPLC (Component determination)	GARDENIAE FRUCTUS GARDENIAE FRUCTUS PULVERATUS	Geniposide Standard 7,000 JPY/20 mg (WAKO)	Sanshin
Loganin	C17H26O10	18524-94-2		1: AcOEt/H ₂ O/HCOOH (6:1:1), 2: 4-methoxybenzaldehyde-H ₂ SO ₄ TS, 90°C, 3 min	red-purple	TLC (Identification)	CORNI FRUCTUS	Loganin Standard 31,500 JPY/20 mg (WAKO)	Sanshuyu
[6]-Gingerol	C17H26O4	23513-14-6		1: hexane/acetone/AcOH (100) (10:7:1), 2: 2,4-dinitrophenylhydrazine TS, 105°C, 10 min	brown	TLC (Identification)	ZINGIBERIS RHIZOMA ZINGIBERIS RHIZOMA PULVERATUM	[6]-Gingerol Standard 13,000 JPY/20 mg (WAKO)	Shokyo
Bufalin, Cinobufagin, Resibufogenin	C24H34O4 (Bufalin), C24H32O4 (Cinobufagin), C24H32O4 (Resibufogenin)	465-21-4 (Bufalin), 470-37-1 (Cinobufagin), 465-39-4 (Resibufogenin)	1: ODS column (I.D. 4-6 mm x 15-30 cm), 2: 300 nm, 3: 40°C, 4: dil. H ₃ PO ₄ (1 in 1000)/CH ₃ CN (11:9) adjust flow rate to elute Int.Std. (Int. Std.= Indometacin in MeOH (1 in 4000) t.t. 1.6-1.9 min.)	1: Resibufogenin cyclohexane/acetone (3:2), 2: dil. H ₂ SO ₄ , 105°C, 5 min	blue-green	HPLC (Component determination) TLC (Identification)	BUFONIS VENENUM	Bufalin Standard 24,000 JPY/20 mg (WAKO), Cinobufagin Standard 18,500 JPY/20 mg (WAKO), Resibufogenin Standard 19,600 JPY/20 mg (WAKO)	Senso
Chikusetsusaponin IV	C47H74O18			1: AcOEt/H ₂ O/HCOOH (5:1:1), 2: dil. H ₂ SO ₄ , 110°C, 5 min	purple-red	TLC (Identification)	PANACIS JAPONICI RHIZOMA	Chikusetsusaponin IV Standard 24,000 JPY/20 mg (KISHIDA)	Chikusetsuminjin
Capsaicin	C18H27NO3	404-86-4	1: phenylated silica gel (I.D. 4.6 mm x 25 cm), 2: 281 nm, 3: 30°C, 4: dil. H ₃ PO ₄ (1 in 1000)/CH ₃ CN (3:2) adjust flow rate to elute capsaicin at ca. 2.0 min	1: Et ₂ O/MeOH (19:1), 2: 2, 6-dibromo-N-chloro-1,4-benzoquinone monoimine TS, stand in NH ₃ gas	blue	TLC (Identification) HPLC (Component determination)	CAPSI FRUCTUS CAPSI FRUCTUS PULVERATUM	Capsaicin Standard 25,000 JPY/20 mg (WAKO)	Togarashi
Naringin	C27H32O14	10236-47-2		1: AcOEt/EtOH(99.5)/H ₂ O (8:2:1), 2: 2, 6-dibromo-N-chloro-1,4-benzoquinone monoimine TS, stand in NH ₃ gas	grayish green	TLC (Identification)	AURANTII PERICARPUM	Naringin Standard 18,900 JPY/20 mg (WAKO)	Tohi
Emetine hydrochloride	C29H40N2O4	483-18-1	1: ODS column (I.D. 4-6 mm x 10-25 cm), 2: 283 nm, 3: 50°C, 4: dissolve sodium 1-heptane sulfonate (2.0g) in H ₂ O (500ml), adjust pH 4.0 with AcOH (100) then add MeOH (500ml) adjust flow rate to elute emetine at ca. 1.4 min			HPLC (Component determination)	IPECACUANHAE RADIX IPECACUANHAE RADIX PULVERATA	**JPY/30 0mg (WAKO, U. S. P. Reference Standards)	Tokon
Arecoline hydrobromide	C8H13NO2	63-75-2		1: Acetone/H ₂ O/AcOH (100) (10:6:1), 2: Iodine TS	red-brown	TLC (Identification)	ARECAE SEMEN		Binroji
Atropine sulfate	C34H48N2O10S	55-48-1	1: ODS column (I.D. 4mm x 15 cm), 2: 210 nm, 3: 20°C, 4: dissolve KH ₂ PO ₄ (6.8g) in H ₂ O (900ml) and add Et ₃ N (10ml) adjust pH 3.5 with H ₃ PO ₄ . Then, add H ₂ O to make exactly 1000 ml. Mix this sol. With CH ₃ CN (9:1). adjust flow rate to elute atropine at ca. 1.4 min (assay for BELLADONNAE RADIX), adjust flow rate to elute scopolamine at ca. 8 min (assay for SCOPOLIAE RHIZOMA)	1: Acetone/H ₂ O/NH ₃ aq (28) (90:7:3), 2: 80°C, 10 min, after cooling Dragendorff's TS	yellow-red	TLC (Identification) HPLC (Assay)	BELLADONNAE RADIX SCOPOLIAE RHIZOMA	Atropine Sulfate Standard 5,200 JPY/20 mg (WAKO)	Berdomrakon, Rotokon

Paconol	C9H1003	532-41-0	1: ODS column (I.D. 4.6 mm x 15-25 cm), 2: 274 nm, 3: 20°C, 4: H ₂ O/CH ₃ CN/AcOH (100) (65:35:2), adjust flow rate to elute paconol at ca.14 min	1: AcOEt/hexane (1:1), 2: UV (254 nm)	no data in JP	TLC (identification) HPLC (Component determination)	MOUTAN CORTEX MOUTAN CORTEX PULVERATUS	Paconol Standard 9,000 JPY/10 mg (WAKO)	Botanpi
Strychnine nitrate	C21H23N3O5	66-32-0	1: ODS column (I.D. 4 mm x 15 cm), 2: 210 nm, 3: 20°C, 4: K ₂ HPO ₄ (6.8g) in H ₂ O (1000 ml)/CH ₃ CN/ Et ₃ N (45:5:1), adjust to pH 3.0 with H ₃ PO ₄ , adjust flow rate to elute strychnine at ca.17 min	1: H ₂ O/1-BuOH/AcOH (100) (5:4:1), 2: 90°C, 10 min		HPLC (Assay)	STRYCHNI SEMEN		Homika
Kainic acid	C10H15NO4	487-79-6	see Atropine sulfate		light yellow	TLC (identification)	DIGENEA	Kainic acid 27,000 JPY/10 mg (FUNAKOSHI)	Makuri
Scopolamine hydrobromide	C17H22BrNO4	114-49-8				HPLC (Assay)	SCOPOLAE RHIZOMA	Scopolamine Hydrobromide n- Hydrate 5,200 JPY/20 mg (WAKO)	Rotokon

List of Reference Sample in 1st Supplementary of JP14

Compound	Molecular Formula	CAS NO.	HPLC (1: Column, 2: Detect, 3: Column Temp., 4: Mobile phase)	TLC condition (1: Dev. solv., 2: Detect)	Color tone on TLC	Application	Name of crude drug	Purchase Information	Japanese name of crude drug
Luteolin	C15H10O6	491-70-3		1: AcOEt/2-butanone/ H ₂ O/HCOOH (2:5:3:1:1), 2: FeCl ₃ -MeOH TS	dark green	TLC (identification)	CHRYSANTHEMI FLOS	Luteolin 6,000 JPY/25 mg	Kikuka
Aristolochic acid I	C17H11NO7	313-67-7	1: ODS column (I.D. 4.6 mm x 25 cm), 2: 400 nm, 3: 40°C, 4: Add NaH ₂ PO ₄ ·2H ₂ O (7.8g) and H ₃ PO ₄ (2 ml) in H ₂ O (1000 ml), mix this solution with CH ₃ CN (11:9) adjust flow rate to elute aristolochic acid I at ca.15 min			HPLC (Purity)	ASIASARI RADIX	Aristolochic acid A 43,300 JPY/5 mg (WAKO) Aristolochic Acid A 12,000 JPY/1 mg (FUNAKOSHI)	Saishin
Rhynchophylline	C22H28N2O4	76-66-4	1: ODS column (I.D. 4.6 mm x 25 cm), 2: 245 nm, 3: 40°C, 4: dissolve AcONH ₄ (3.85 g) in H ₂ O (200 ml) and add AcOH (100) 10 ml into this solution, then add H ₂ O to make exactly 1000 ml. Add CH ₃ CN (350 ml) into this solution, adjust flow rate to elute rhynchophylline at ca.15 min			HPLC (Component determination)	UNCARIAE UNGIS CUM RAMULUS	Rhynchophylline Standard 22,000 JPY/10 mg (KISHIDA)	Chotoko
Hirsutine	C22H28N2O3		245 nm, 3: 40°C, 4: dissolve AcONH ₄ (3.85 g) in H ₂ O (200 ml) and add AcOH (100) 10 ml into this solution, then add H ₂ O to make exactly 1000 ml. Add CH ₃ CN (350 ml) into this solution, adjust flow rate to elute rhynchophylline at ca.15 min			HPLC (Component determination)	UNCARIAE UNGIS CUM RAMULUS	Hirsutine Standard 35,000 JPY/5 mg (WAKO)	Chotoko

List of Reference Sample in JP15

Compound	Molecular Formula	CAS NO.	HPLC (1: Column, 2: Detect, 3: Column Temp., 4: Mobile phase)	TLC condition (1: Dev. solv., 2: Detect)	Color tone on TLC	Application	Name of crude drug	Purchase Information	Japanese name of crude drug
Icarin	C33H40O15	489-32-7		1: AcOEt/EtOH (99.5)/H ₂ O (8:2:1), 2: UV (254 nm)	dark purple	TLC (Identification)	EPIMEDII HERBA	Icarin 25,000 JPY/20 mg (WAKO)	In-yo-kaku
Benzoylmesaconine hydrochloride	C31H43NO10	86500-43-8		1: AcOEt/EtOH (99.5)/NH ₃ aq (28) (40:3:2), 2: dragendorff's TS + sodium nitrite TS	yellow-brown	TLC (Identification)	PROCESSI ACONITI RADIX, PROCESSI ACONITI RADIX PULVERATA	Benzoylmesaconine Hydrochloride 15,000 JPY/5 mg (WAKO)	Bushi, Bushi-matsu
Osthole	C15H16O3	484-12-8		1: n-hexane/AcOEt (2:1), 2: UV (365 nm)	blue-white fluorescent	TLC (Identification)	CNIDI MONNIERIS FRUCTUS	Osthole 20,000 JPY/20 mg (WAKO)	Jya-syou-shi
Chlorogenic acid	C16H18O9	327-97-9		1: AcOEt/H ₂ O/HCOOH (6:1:1), 2: UV (365 nm)	blue-white fluorescent	TLC (Identification)	LONICERAE FOLIUM CUM CAULIS	Chlorogenic Acid 54,600 JPY/ 50 mg (WAKO)	Nin-dou
Aconitine	C34H47NO11	302-27-2	1: ODS column (I.D. 4.6 mm x 15 cm), 2: 231 nm (aconitine, hyapaconitine, mesaconitine), 254 nm (jesaconitine), 3: 40°C, 4: phosphate buffer solution for aconite root/tetrahydrofuran (183:17), adjust flow rate to elute mesaconitine at ca.31 min			HPLC (Purity)	PROCESSI ACONITI RADIX, PROCESSI ACONITI RADIX PULVERATA	Aconitine Standard 39,500 JPY/50 mg (WAKO)	Bushi, Bushi-matsu
Jesaconitine	C35H49NO12	16298-90-1	1: ODS column (I.D. 4.6 mm x 15 cm), 2: 231 nm (aconitine, hyapaconitine, mesaconitine), 254 nm (jesaconitine), 3: 40°C, 4: phosphate buffer solution for aconite root/tetrahydrofuran (183:17), adjust flow rate to elute mesaconitine at ca.31 min			HPLC (Purity)	PROCESSI ACONITI RADIX, PROCESSI ACONITI RADIX PULVERATA		Bushi, Bushi-matsu
Hypaconitine	C33H45NO10	6900-87-4	1: ODS column (I.D. 4.6 mm x 15 cm), 2: 231 nm (aconitine, hyapaconitine, mesaconitine), 254 nm (jesaconitine), 3: 40°C, 4: phosphate buffer solution for aconite root/tetrahydrofuran (183:17), adjust flow rate to elute mesaconitine at ca.31 min			HPLC (Purity)	PROCESSI ACONITI RADIX, PROCESSI ACONITI RADIX PULVERATA	Hypaconitine 48,000 JPY/20mg (WAKO)	Bushi, Bushi-matsu
Mesaconitine	C33H45NO11	2752-64-9	1: ODS column (I.D. 4.6 mm x 15 cm), 2: 231 nm (aconitine, hyapaconitine, mesaconitine), 254 nm (jesaconitine), 3: 40°C, 4: phosphate buffer solution for aconite root/tetrahydrofuran (183:17), adjust flow rate to elute mesaconitine at ca.31 min			HPLC (Purity)	PROCESSI ACONITI RADIX, PROCESSI ACONITI RADIX PULVERATA	Mesaconitine 48,000 JPY/20mg	Bushi, Bushi-matsu