

Table I. **Evidence for the identification of proteins with two or more peptide matches.** Theoretical/hypothetical pI values are shown for proteins identified from public databases, but could not provided when matches were based on opium poppy EST information since most entries do not contain complete nucleotide sequence data.

Spot Number	Accession Number	Protein Name	Unique Peptides (EST)	Unique Peptides (Public)	Sequence Coverage (%)	Protein Score	Species	pI
1	AAB91471	Heat shock protein 70		10	15	143	<i>Spinacia oleracea</i>	5.2/4.9
2	NP_001066486	Heat shock protein 70		6	12	160	<i>Oryza sativa</i>	5.2/4.9
3	gi004052	Protein disulfide isomerase	5		15	106	<i>Papaver somniferum</i>	
5	AAP44754	RuBisCO large subunit binding protein subunit α		6	13	215	<i>Oryza sativa</i>	4.8/4.9
	gi003286	RuBisCO large subunit binding protein subunit α	6			132	<i>Papaver somniferum</i>	
9	AAC19402	26S Proteasome regulatory subunit		4	13	150	<i>Mesembryanthemum crystallinum</i>	4.5/4.6
14	P54776	26S Protease regulatory subunit		8	23	96	<i>Solanum lycopersicum</i>	4.9/5.1
	gi001412	26S Proteasome regulatory subunit	4			73	<i>Papaver somniferum</i>	
29	NP_001047463	Succinyl-CoA synthetase		15	12	282	<i>Oryza sativa</i>	6/5.4
31	NP_001047463	Succinyl-CoA synthetase		5	13	92	<i>Oryza sativa</i>	6/5.5
32	AAP73449	Actin		9	29	367	<i>Gossypium hirsutum</i>	5.3/5.5
	gi003061	Actin	6			109	<i>Papaver somniferum</i>	
35	CAA46787	Glutamate semialdehyde aminotransferase		3	9	108	<i>Nicotiana tabacum</i>	6.2/5.7
36	gi005744	Monodehydroascorbate reductase	3			90	<i>Papaver somniferum</i>	5.3/5.7
37	NP_176015	Phosphoglycerate kinase		6	25	180	<i>Arabidopsis thaliana</i>	5.7/5.8
47	AAD03394	ATPase		8	20	551	<i>Nicotiana sylvestris</i>	5.7/5.6
	gi002525	ATPase	3			84	<i>Papaver somniferum</i>	
48	AAD03394	ATPase		10	24	250	<i>Nicotiana sylvestris</i>	6/5.6
	gi001192	ATPase	1			106	<i>Papaver somniferum</i>	
49	gi011007	Alanine aminotransferase	3			135	<i>Papaver somniferum</i>	
50	Q6RIB7	Enolase		2	11	105	<i>Medicago truncatula</i>	5.8/5.6
50	AAD03394	ATPase		7	20	156	<i>Nicotiana sylvestris</i>	
51	gi11007	Alanine aminotransferase	4			97	<i>Papaver somniferum</i>	
52	AAR05449	Alanine aminotransferase		3	7	100	<i>Capsicum annuum</i>	5.3/5.7

	gi11007	Alanine aminotransferase	3			126	<i>Papaver somniferum</i>	
53	CAA75478	ATPase		6	20	158	<i>Sorghum bicolor</i>	6/5.7
53	P42896	Enolase		3	17	100	<i>Ricinus communis</i>	5.6/5.7
	gi2148	Enolase	3			93	<i>Papaver somniferum</i>	
55	Q43321	Enolase		5	17	133	<i>Alnus glutinosa</i>	5.4/5.8
55	gi2148	Enolase	6			115	<i>Papaver somniferum</i>	
57	P42896	Enolase		5	13	133	<i>Ricinus communis</i>	5.7/5.9
	gi2148	Enolase	7			136	<i>Papaver somniferum</i>	
		6-Phosphogluconate dehydrogenase						
58	NP_176601	dehydrogenase		5	13	155	<i>Arabidopsis thaliana</i>	5.3/5.9
59	P42896	Enolase		2	8	93	<i>Ricinus communis</i>	5.6/5.8
	gi8117	Enolase	2			102	<i>Papaver somniferum</i>	
60	gi4235	Dihydroxyacid dehydratase	3			78	<i>Papaver somniferum</i>	
		2,3-Bisphosphoglycerate-independent phosphoglycerate mutase						
63	P35494	mutase		2	3	112	<i>Oryza sativa</i>	6/5.7
64	NP_001045601	Chaperonin/Heat shock protein		5	12	124	<i>Oryza sativa</i>	6.3/5.7
		2,3-Bisphosphoglycerate-independent phosphoglycerate mutase						
67	NP_187471	mutase		4	8	117	<i>Arabidopsis thaliana</i>	5.5/5.6
		2,3-Bisphosphoglycerate-independent phosphoglycerate mutase						
68,69	P35494	mutase		3	5	85	<i>Nicotiana tabacum</i>	6/5.6
70	Q05046	Chaperonin (HSP60)		11	20	151	<i>Cucurbita maxima</i>	6.3/5.5
	gi1840	GroEL-like chaperone, ATPase	4			65	<i>Papaver somniferum</i>	
71	Q05046	Chaperonin (HSP60)		14	21	148	<i>Cucurbita maxima</i>	6.3/5.5
72	NP_001045601	GroEL-like chaperone, ATPase		4	8	171	<i>Oryza sativa</i>	6.3/5.4
74	NP_001045601	GroEL-like chaperone, ATPase		5	10	115	<i>Oryza sativa</i>	5.8/5.3
74	AAN63805	Chaperonin (HSP60)		3	6	97	<i>Prunus dulcis</i>	5.8/5.3
78	ABN05716	Chaperone DnaK		4	8	132	<i>Medicago truncatula</i>	6/5.5
	gi10796	Heat shock protein 70	4			96	<i>Papaver somniferum</i>	
80	CAB37531	Heat shock protein 70		2	4	80	<i>Arabidopsis thaliana</i>	5.5/5.4
81	NP_195869	Heat shock protein 70		3	10	109	<i>Arabidopsis thaliana</i>	5/5.4
83	NP_001051724	Heat shock protein 70		6	15	196	<i>Oryza sativa</i>	5.1/5.4
84	AAN86274	Heat shock protein 70		10	20	137	<i>Cucurbita maxima</i>	5.1/5.3
	gi4543	Heat shock protein 70	3			104	<i>Papaver somniferum</i>	
85	P49118	Heat shock protein 70		5	9	166	<i>Solanum lycopersicum</i>	5.1/5.4
	gi357	Heat shock protein 70	3			82	<i>Papaver somniferum</i>	
86	P24067	Heat shock protein 70		2	4	86	<i>Zea mays</i>	5.15.4

	gi7117	Heat shock protein 70	2			75	<i>Papaver somniferum</i>	
87	P49118	Heat shock protein 70		10	15	197	<i>Solanum lycopersicum</i>	5.1/5.3
	gi4543	Heat shock protein 70	2			115	<i>Papaver somniferum</i>	
	gi2999	Heat shock protein 70	2			83	<i>Papaver somniferum</i>	
88	BAA12348	Luminal binding protein precursor		5	8	187	<i>Arabidopsis thaliana</i>	5.1/5.3
91	P54774	Cell division cycle protein 48		6	8	87	<i>Glycine max</i>	5.2/5.3
116	NP_187789	Chaperonin		4	6	70	<i>Arabidopsis thaliana</i>	6.0/6.0
129	AAL05454	Enolase		4	10	94	<i>Nitella opaca</i>	5.2/6
133	Q9LKG7	UDP-glucose pyrophosphorylase		4	8	122	<i>Astragalus membranaceus</i>	
141	AAV66502	ATPase		6	16	112	<i>Plantago coronopus</i>	7.8/6.4
	gi2886	ATPase	3			58	<i>Papaver somniferum</i>	
151	P49611	SAM synthetase		2	7	113	<i>Ostreococcus tauri</i>	5.5/6.2
155	AAG42490	SAM synthetase		6	15	231	<i>Suaeda salsa</i>	5.8/6
	gi5003	SAM synthetase	2			98	<i>Papaver somniferum</i>	
156	P48498	SAM synthetase		5	14	272	<i>Petunia x hybrida</i>	5.5/6
	gi10131	SAM synthetase	4			96	<i>Papaver somniferum</i>	
157	P48498	SAM synthetase		5	17	267	<i>Petunia x hybrida</i>	5.5/6
	gi1853	SAM synthetase	3			112	<i>Papaver somniferum</i>	
158	Q96552	SAM synthetase		4	21	123	<i>Catharanthus roseus</i>	5.5/6
159	BAA86060	Dihydroorotate dehydrogenase		2	5	130	<i>Pyrus pyrifolia</i>	6.2/5.9
	gi10476	Dihydroorotate dehydrogenase	2			73	<i>Papaver somniferum</i>	
160	AAN07179	SAM synthetase		7	18	370	<i>Carica papaya</i>	5.5/5.9
	gi5003	SAM synthetase	2			108	<i>Papaver somniferum</i>	
161	gi2111	Dihydroorotate dehydrogenase	2			110	<i>Papaver somniferum</i>	
161	BAA86060	Enolase		2	5	84	<i>Pyrus pyrifolia</i>	6.4/5.8
165	gi4434	Alcohol dehydrogenase	2			63	<i>Papaver somniferum</i>	
166	gi10244	Glutamate dehydrogenase	3			83	<i>Papaver somniferum</i>	
167	gi10244	Pyruvate dehydrogenase	3			84	<i>Papaver somniferum</i>	
168	CAA61511	Mitochondrial elongation factor Tu		8	17	117	<i>Arabidopsis thaliana</i>	5.5/6.2
	gi11996	Mitochondrial elongation factor Tu	4			88	<i>Papaver somniferum</i>	
172	CAH58641	Malate dehydrogenase		7	27	185	<i>Plantago major</i>	6.1/6.4
	gi1623	Malate dehydrogenase	2			70	<i>Papaver somniferum</i>	
		Glyceraldehyde-3-phosphate dehydrogenase						
172	gi4105	dehydrogenase	4			203	<i>Papaver somniferum</i>	
	gi4054	Malate dehydrogenase	5			91	<i>Papaver somniferum</i>	
173	P17783	Malate dehydrogenase		5	13	133	<i>Vitis vinifera</i>	8.2/6.5
173	gi1623	Malate dehydrogenase	3			131	<i>Papaver somniferum</i>	
	gi4105	Malate dehydrogenase	2			82	<i>Papaver somniferum</i>	

174	AAB61592	Fructosebiphosphate aldolase		3	12	106	<i>Mesembryanthemum crystallinum</i>	6.5/6.5
175	NP_564625	Malate dehydrogenase		2	10	92	<i>Arabidopsis thaliana</i>	6.4/6.5
	gi1623	Malate dehydrogenase	2			86	<i>Papaver somniferum</i>	
176	gi4054	Malate dehydrogenase	4			96	<i>Papaver somniferum</i>	
177	CAH58641	Malate dehydrogenase		6	18	134	<i>Plantago major</i>	6.1/6.7
	gi11554	Malate dehydrogenase	5			110	<i>Papaver somniferum</i>	
182	gi7829	Flavoprotein pyridine nucleotide cytochrome reductase	3			72	<i>Papaver somniferum</i>	
183	O48551	20S Proteasome α subunit		3	23	97	<i>Glycine Max</i>	5.8/6.4
	gi8292	Proteosome α subunit	5			93	<i>Papaver somniferum</i>	
184	gi6066	Dirigent-like protein	3			74	<i>Papaver somniferum</i>	
185	CAC19494	20S Proteasome α subunit		3	15	92	<i>Zea mays</i>	5.8/6.3
186	Unknown	Hypothetical protein		1		102	<i>Medicago truncatula</i>	7.7/6.2
	gi9514	Hypothetical protein/putative ATP synthase	6			95	<i>Papaver somniferum</i>	
188	AAD03394	ATPase		3	6	79	<i>Nicotiana glauca</i>	6.1/6.1
	gi2525	ATPase	2			62	<i>Papaver somniferum</i>	
192	Q6YYW3	Malate dehydrogenase		5	19	132	<i>Oryza sativa</i>	7/6.1
193	Q6YYW3	Malate dehydrogenase		6	19	96	<i>Oryza sativa</i>	7.6/6.1
194	NP_001043900	ATPase		8	22	187	<i>Oryza sativa</i>	5.3/6.1
	gi2525	(<i>R,S</i>)-Norcoclaurine 6- <i>O</i> -methyltransferase	2			74	<i>Papaver somniferum</i>	
196	gi2585	(<i>R,S</i>)-Norcoclaurine 6- <i>O</i> -methyltransferase	3			88	<i>Papaver somniferum</i>	
197	CAA42103	Glyceraldehyde-3-phosphate dehydrogenase		4	13	210	<i>Antirrhinum majus</i>	6.1/6.2
197	CAH58641	Malate dehydrogenase		4	22	246	<i>Plantago major</i>	7.1/6.2
	gi11554	Malate dehydrogenase	4			82	<i>Papaver somniferum</i>	
198	Q6YYW3	Malate dehydrogenase		4	13	213	<i>Papaver somniferum</i>	
201	AAB61672	Type IIIa membrane protein cpwap13		3	8	155	<i>Vigna unguiculata</i>	6.2/6
202	AAC49651	Actin		5	18	239	<i>Striga asiatica</i>	5.4/6
	gi3061	Actin	3			90	<i>Papaver somniferum</i>	
206	NP_192629	Arginase		2	6	124	<i>Papaver somniferum</i>	
208	AAC49964	Isocitrate dehydrogenase		2	5	140	<i>Arabidopsis thaliana</i>	8.4/5.9
212	O81154	Cysteine synthase		4	16	174	<i>Solanum tuberosum</i>	6.3/5.9
215	gi1617	Pyruvate dehydrogenase	1			127	<i>Papaver somniferum</i>	
226	AAC05116	Isoflavone reductase-like protein		2	8	86	<i>Betula pendula</i>	7.9/5.4

	gi11276	Isoflavone reductase-like protein	4			116	<i>Papaver somniferum</i>	
	gi9146	Isoflavone reductase-like protein	4			72	<i>Papaver somniferum</i>	
228	AAA80675	Fructokinase		3	10	125	<i>Beta vulgaris</i>	5.4/5.2
	gi7177	Fructokinase	3			66	<i>Papaver somniferum</i>	
230	gi7784	Catalytic coenzyme binding protein	3			86	<i>Papaver somniferum</i>	
230	gi3266	Catalytic coenzyme binding protein	5			72	<i>Papaver somniferum</i>	
237	ABA81880	Proteosome		5	19	143	<i>Solanum tuberosum</i>	5.4/5.4
	gi542	Proteosome α subunit	3			131	<i>Papaver somniferum</i>	
239	gi4542	20S Proteasome α subunit	4			79	<i>Papaver somniferum</i>	
242	gi7169	Ascorbate peroxidase	3			106	<i>Papaver somniferum</i>	
244	gi7169	Ascorbate peroxidase	3			91	<i>Papaver somniferum</i>	
250	gi6158	20S Proteasome α subunit	4			65	<i>Papaver somniferum</i>	
269	gi6948	Glutathione S-transferase	2			60	<i>Papaver somniferum</i>	
273	gi7648	Proteosome α subunit	5			62	<i>Papaver somniferum</i>	
278	gi8181	Eukaryotic initiation factor	5			77	<i>Papaver somniferum</i>	
281	gi3791	Ascorbate peroxidase	3			115	<i>Papaver somniferum</i>	
	gi1161	Ascorbate peroxidase	3			62	<i>Papaver somniferum</i>	
282	gi8637	Triosphosphate isomerase	2			138	<i>Papaver somniferum</i>	
286	gi5847	Proteosome β subunit	5			83	<i>Papaver somniferum</i>	
288	gi8262	Dirigent-like protein	3			81	<i>Papaver somniferum</i>	
	gi5537	Unknown	2			73	<i>Papaver somniferum</i>	
291	gi1373	Pathogenesis-related protein	2			50	<i>Papaver somniferum</i>	
294	gi2159	Pathogenesis-related protein	3			89	<i>Papaver somniferum</i>	
295	gi2159	Pathogenesis-related protein	3			63	<i>Papaver somniferum</i>	
305	gi6644	Triosphosphate isomerase	3			63	<i>Papaver somniferum</i>	
309	gi9414	ATP synthase D chain, mitochondrial (ATP5H)	3			89	<i>Papaver somniferum</i>	
311	gi693	Pathogenesis-related protein	2			68	<i>Papaver somniferum</i>	
314	gi4973	Thioredoxin	4			80	<i>Papaver somniferum</i>	
316	BAA03741	RNA-binding glycine rich protein		2	15	111	<i>Nicotiana sylvestris</i>	5.6/5.7
	gi693	RNA-binding glycine rich protein	2			87	<i>Papaver somniferum</i>	
317	BAA03743	RNA-binding glycine rich protein		3	23	140	<i>Nicotiana sylvestris</i>	5.6/5.8
320	gi8013	Non-symbiotic hemoglobin	3			60	<i>Papaver somniferum</i>	
331	gi2775	Copper chaperone	3			64	<i>Papaver somniferum</i>	
336	P27161	Calmodulin		2	24	205	<i>Solanum lycopersicum</i>	4.1/4.3
336	gi7597	Calmodulin	3			104	<i>Papaver somniferum</i>	
337	1109190A	Calmodulin		5	36	254	<i>Triticum aestivum</i>	4.1